

PUBLISHED
EVERY
MONDAY

Croplife

WEST MARKETING EDITION

With Added Regional Circulation to the West Marketing Segment

TOTAL CIRCULATION
OVER 9,070 COPIES
EACH WEEK
EPA Member, Business Publications Audit

A WEEKLY NEWSPAPER FOR THE FARM CHEMICAL MANUFACTURER, FORMULATOR AND DEALER

Published by The Miller Publishing Co., Minneapolis, Minn.

Vol. 6

Publication at Minneapolis, Minn.
Accepted as Controlled Circulation

MAY 4, 1959

Subscription Rates:
\$5 for 1 year, \$9 for 2 years

No. 18

1959 Fertilizer Supplies Up 8% - USDA

WASHINGTON — Fertilizer supplies for the 1959 season are dependent upon what the trade will accept, rather than the industry's production capacities, the U.S. Department of Agriculture declared in its annual report on "The Fertilizer Situation."

Shortages may occur locally during spring buying heights, the report continued, because of transportation bottlenecks and overloaded handling facilities. These occurrences will be temporary, however.

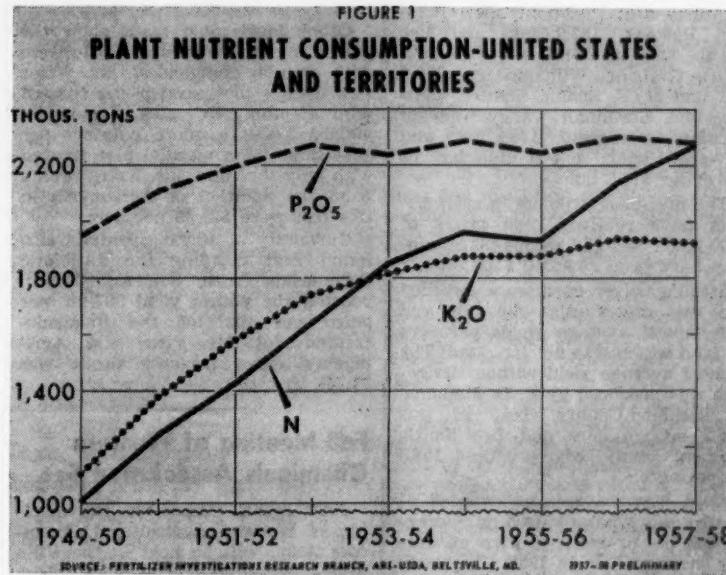
The report is prepared each year by the USDA's agricultural chemicals staff of the Commodity Stabilization Service. Harold H. Shepard was in charge. Assisting Mr. Shepard were John N. Mahan, fertilizer specialist, and Charlotte A. Graham, administrative assistant.

The industry has considerable optimism that spring movement will be greater in 1958-59 than in 1957-58, the report said. Domestic supplies of nitrogen, phosphate and potash for 1958-59 are expected to total 7,300,000 tons or more than 8% higher than in 1957-58.

These estimates of 1958-59 supplies are projections based on available data (largely limited to the first six months of the fertilizer year which runs from July 1 through June 30) for inventories, rates of production and foreign trade.

Advances in the industry and changing fertilization practices on farms are causing shifts in types and forms of fertilizer materials for both mixed fertilizer manufacture and direct application, the report said. Changes in the kinds of materials

(Turn to USDA'S REPORT, page 20)



Bill Introduced in House to Include More Materials Under Pesticide Act

—Text of Bill on Page 8
—Editorial on Page 22—

WASHINGTON—A bill to amend the Federal Insecticide, Fungicide and Rodenticide Act of 1947 has been introduced by Rep. Harold D. Cooley (D., N.C.), chairman of the House Agriculture Committee. (Croplife, April 27, page 1.) The bill, designated as H.R. 6436, would amend the Act of 1947 to extend its coverage to include nematocides, defoliants, desiccants and plant regulators.

This objective would be reached by expanding the present definition of the term "economic poison" to include these materials. It would also amend other definitions in the Act and add additional ones as made necessary by the broader coverage. The proposed amendment does not change the provisions of the Act as they relate to presently-regulated products, however.

The bill would directly subject the products involved to the same labeling, registration, and regulatory controls under the Act as now apply to agricultural chemicals used for pest control purposes. By placing them under that Act, the bill would also effectively, although indirectly, place them under the "Pesticide Chemicals Amendment" to the Federal Food, Drug, and Cosmetic Act (P.L. 518,

83rd Congress), insofar as residues in or on raw agricultural commodities may be involved, because of the interrelationship of the two Acts.

The bill would become effective upon enactment and thus permit the Department of Agriculture to begin the registration of the newly regulated products, and also permit the Department of Health, Education, and Welfare to establish tolerances for them on raw agricultural commodities. However, in order to per-

(Turn to BILL, page 17)

USDA'S REPORT AT A GLANCE

★ • Domestic supplies of nitrogen, phosphate and potash materials are expected to be up 8% for 1958-59 over the previous period.

• Nitrogen supplies are expected to be more than 6% higher than the 1957-58 period.

• Nitrogen use over the past 10 years has grown more rapidly than any of the other materials.

• Phosphate (P₂O₅) supplies available are expected to run 5.7% more than the previous reporting period.

• Potash (K₂O) supplies are estimated to be 13.3% higher in the 1958-59 period than in the 1957-58 period.

• The practice of direct application of straight materials has been rising markedly in the past decade or so.

Plans Advance for Northwest Conference

PORLAND, ORE.—Advance hotel reservation cards for the regional fertilizer conference, co-sponsored by the Pacific Northwest Plant Food Assn. and the state colleges and universities of the area, July 7-9 at the Winthrop Hotel, Tacoma, Wash., have been placed in the mails.

Leon Jackson, secretary, announced that program arrangements are rapidly nearing completion. A field trip to the Western Washington Experiment Station is scheduled for July 7. An all-day speakers' program will be held July 8, with a social hour and banquet the same evening.

Fertilizer Consumption on Increase Throughout World, 1958 FAO Report Indicates

NEW YORK—Consumption of fertilizers on a world-wide basis continues to move ahead at a significant rate, according to a comprehensive report issued by the Food and Agriculture Organization of the United Nations. The expected gain for the fertilizer year of 1959 is set at 5% for all fertilizers, with nitrogen and potash showing gains of 7% and 6%, respectively, and phosphoric acid gaining by some 3%.

FAO's figures on fertilizer consumption for the past three years show significant increases on a world scale. Calculated in metric tons, (2,204.6 lb.) world use in 1956 was 19,339,000. The next year it made an 11% jump to 21,746,000 metric tons. The total for 1958 was 3% over

that of the previous year, or 22,105,000 metric tons. Estimated consumption for the year ending June 30, 1959, increases the 1958 figure by 5%, to 23,249,000 metric tons.

The increase for this year (1959) was greater than had been anticipated, since earlier appraisals had indicated a possible leveling off of consumption following several years of rise. Thus, over three whole years, mid-1956 to mid-1959, the increase in world consumption of all fertilizers will be 20%.

Here is the way the three main components gained in consumption during these three years:

Nitrogen increased 24%.
(Turn to FAO, page 21)

1958 Corn Borer Loss Exceeds 100 Million Bushels

Heaviest Damage Noted in Iowa, Nebraska, Illinois

—See Table on Page 20—

WASHINGTON—More than 100 million bushels of U.S. corn—about 2.9% of the nation's entire crop—were lost because of European corn borer damage in 1958, the U.S. Department of Agriculture reports. This compares with an estimated loss of 180,897,000 bu. in 1957.

Comparatively, losses during 1958 in the 20 chief grain-producing states (the total was estimated to be 100,699,000 bu.) were low. In only three of the past 10 years has borer damage been less costly to corn growers. Nevertheless, the estimated value of the corn lost last year to borers was \$98,434,000—enough to buy about 437,000 acres (at \$225 per acre) of good farm land in the Corn Belt.

Largest corn losses occurred in (Turn to CORN BORER, page 8)

Western Fertilizer, Inc., Incorporated in Colorado

BURLINGTON, COLO.—Western Fertilizer, Inc., has been incorporated to establish, maintain, operate and finance a general fertilizer business by Donald A., Jeanne and J. M. Caldwell; directors are the same.



Calvin C. Dorough

NEW MANAGER—The appointment of Calvin C. Dorough to the position of manager of California Spray-Chemical Corp.'s new \$4,600,000 fertilizer plant, now under construction at Kennewick, Wash., was recently announced by Frank J. Juchter, manager of Calspray's manufacturing department. Mr. Dorough will report to Kennewick ahead of plant opening, tentatively scheduled for the fall of this year. In the meantime, he will make his headquarters in the home office at Richmond, Cal. Supervisor of fertilizer manufacturing at the Richmond plant for the past four years, Mr. Dorough has a long history of plant management. Before coming to Calspray he was plant manager for Best Fertilizer Co. Previous to this, he was plant engineer at the Spreckels Sugar Co.'s plant in Salinas, Cal.

Special Slide Program Prepared by NAC Assn.

(See Editorial, Page 22)

WASHINGTON—Availability of a special slide program on pesticide chemicals and their use in protecting the nation's food supplies, property and health, was announced by the National Agricultural Chemicals Assn., which produced the program.

The program, entitled "Pesticides—Boon to Mankind," is designed specifically to show to men's and women's business and professional clubs, garden clubs and similar organizations. It consists of 58 selected 35mm color slides and printed script which can be presented in 25 to 30 minutes with simple projection equipment.

Groups interested may obtain a free copy, or loan, by writing NACA, Department of Information, 1145 Nineteenth St., N.W., Washington 6, D.C.

Charles A. Parker, 49, Aviation Leader, Dies

WASHINGTON—Charles A. Parker, 49, executive director of National Aviation Trades Assn., died April 21, of a heart attack complicated by diabetes.

Mr. Parker was a long-time spokesman for aviation service operators and aerial applicators. He personally was given credit for making the association for which he worked a "purposeful and respected" group.

He was a Northeastern University graduate. In 1928 he started working in aviation, selling rides at air meets. After that he managed a scheduled airline operation in the Cape Cod area.

Since that time he has served the industry in many ways.

He was a member of the Air Coordinating Committee's industry advisory panel and served as advisor to a number of aviation committees. He also was a member of many other aviation groups.

South Carolina Corn Contest Winner Has 182.6 Bushel Yield

CLEMSON, S.C.—First-place winner in the 1958 South Carolina corn contest is Robert Benton Nickles, Greenwood County. His official average yield is 182.6 bu. an acre on a three-acre demonstration. Second-place winner is W. N. Henderson, Greenwood County. His average yield was 182.3 bu. an acre on three acres.

Mr. Nickles has been awarded a cash prize of \$600 and Mr. Henderson a cash prize of \$250.

Winners of first and second places in the three extension district contests, their home counties, and average yields per acre on 3-acre demonstrations are: Piedmont, Sam Bolding, Pickens, 163.9 bu., and Lee Smith, Oconee, 158.4 bu.; Pee Dee, J. P. Graham, Williamsburg, 160.2 bu., and N. E. Spann, Sumter, 139.5 bu., and Savannah Valley, Meylon Nickles, Greenwood, 176.2 bu., and Edward Hagan, a 4-H club boy of Abbeville, 173.2 bu.

The first-place winners in each district have received cash prizes of \$200 each, and the second-place winners have been awarded \$100 each.

Sterling silver cups were awarded the two contestants who produced the highest average yields per acre on land which was not irrigated. The highest average yield without irrigation was produced by B. D. Manning, Jr., Richland County, whose yield was 166.2 bu. an acre and Lee Smith, Oconee County, who produced 158.4 bu. an acre.

Gold keys have been awarded 61 contestants who produced an average of 100 bu. or more of corn an acre for the first time in 1958. They were also enrolled as members of the South Carolina 100-Bushel Corn Club. Certificates have been awarded 49 other contestants who have previously earned membership in the club and have already received keys and who in 1958 again produced 100 bu. or more of corn an acre.

The 1958 contest was sponsored by the South Carolina Plant Food Educational Society. It was conducted by the Clemson College extension service. The winners were selected by a special awards committee of the society. The selections were based on calculated yields as determined by measurements, ear counts, weights and moisture tests made by the extension service.

Shorter Time Interval for Malathion Before Harvest

NEW YORK—A shorter time interval between application and harvesting of certain fruit and vegetable crops has been allowed for malathion, according to American Cyanamid Co., maker of the product. Tomato growers may apply the insecticide up to one day before the harvest for control of spider and tomato russet mites and aphids, the company says. The former interval was three days.

Other crops on which the time interval has been reduced include cucumbers, squash, melons and brambles for control of pests such as codling moth, plum curculio, red-banded leaf roller, mealybugs and pear psylla.

The time interval between the last application of parathion before harvest has also been shortened, the company reports. Use of the pesticide against plume moth and aphids in artichokes can be made up to seven days before harvest as compared to fifteen days previously.

A tolerance of one part per million of parathion on artichokes has been established. The pest control branch of the U.S. Department of Agriculture has ruled the tolerance may be met with a seven-day time interval.

Antibiotics Boost Yields In Idaho Potato Tests

NEW YORK—Recent tests at the University of Idaho showed that Agri-mycin, a combination of the antibiotics Terramycin and streptomycin, can boost grower profits \$7 to \$23 per acre, according to F. C. Visor, specialty product manager for Chas. Pfizer & Co., Inc., producer of the formulation. He said that field tests to date have shown that Agri-mycin controls blackleg and bacterial soft rot of potatoes and increases both production and income.

In experiment station tests in Idaho, seed pieces treated with Agri-mycin and the fungicide Phygon XL ten days before planting yielded almost 1,200 lb. more potatoes per acre than did seed treated with only the Phygon. Pfizer spokesmen say the extra profit with antibiotic treatment in this case was \$23.24 per acre.

Other Idaho field trials show the advantage of combining Agri-mycin with regular fungicides, Mr. Visor said. In one plot, seed pieces treated with Captan "75" plus Agri-mycin yielded 1,000 lb. more potatoes per acre than did a parallel plot treated with only the fungicide. Extra profits from the addition of Agri-mycin in this test were \$21.30 per acre.

University of Idaho scientists also found that coupling the antibiotic formulation with Semesan Bel/10 boosted the potato yield 387 lb. per acre over that of the fungicide-treated plot, Mr. Visor said. Agri-mycin's extra per-acre profit was \$7.74.

Fall Meeting of Western Chemicals Association Set

SAN JOSE, CAL.—The fall meeting of Western Agricultural Chemicals Assn. will be held in the Villa Motel, San Mateo, Cal., Oct. 13-14, 1959, according to an announcement by C. O. Barnard, executive secretary.

The program will feature speakers from Washington, D.C., and Kansas City, Mo. There will be two panel discussions. One panel will consider five areas of business procedures. The second panel will be devoted to five aspects of the marketing of agricultural chemicals in the western states.

At attendance of at least 250 is expected.

Virus Disease May Help To Control Citrus Mite

WASHINGTON—A possible new method of biological control of citrus red mite has been announced by the U.S. Department of Agriculture. Entomologists state that a disease, believed to be from a virus, is transmissible from sick mites to healthy insects and is also transmissible through spraying with water suspensions prepared from ground-up diseased mites and passed through filter paper.

The disease was observed in mites collected near Oxnard, Cal. by USDA scientists. Laboratory tests indicated its property of being transmissible from infected to healthy mites.

First discovered by Francis Munger, J. E. Gilmore and W. S. Davis, the disease was tested on mites from different areas under varying temperatures and degrees of humidity.

The disease takes from 7 to 18 days to manifest itself, depending probably on the concentration of inoculum introduced and the temperature. All stages of mites, except the eggs, appear to be susceptible.

When a culture of newly collected Oxnard mites was found to be almost completely wiped out, experiments were started to see whether this condition was transmissible. Healthy mites were brushed onto lemons without removing any of the diseased mites or debris. A control culture was started at the same time.

The culture containing the diseased mites was found to be almost wiped out. Mites in the control culture were abundant and thriving. Mortality rate for the diseased culture was approximately 96%.

Much is still to be learned about this disease and its value in control of mites, especially those which have developed resistance to miticides, USDA says. Field trials are planned to find if new infections can be initiated in the field and whether mites can be controlled effectively with sprays containing the newly discovered pathogen. Studies are also planned to find out more about present distribution of the disease.

PRICE REDUCTION

LOS ANGELES—United States Borax & Chemical Corp. has announced that new methods of manufacturing Firebreak, its chemical forest-fire retardant, have led to a substantial price reduction.

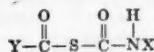


CONSTRUCTION continues to move ahead on the new \$9.5 million plant of the Valley Nitrogen Producers, Inc., according to Louis A. Rozzoni, president of the California Farm Bureau Federation and a director of the fertilizer-producing cooperative. Shown above is the 125-acre plant location near Helm, in Fresno County. The circled numbers indicate the following: (1) sulfuric acid storage; (2) aqua ammonia storage; (3) NH₃ storage; (4) sulfuric acid plant; (5) utilities; (6) NH₃ plant; (7) ammonium sulfate and amino-phos plants and storage; (8) railroad spurs; (9) Colorado Avenue; (10) Southern Pacific mainline. Of the 125 acres owned by Valley Nitrogen, the plant area covers approximately 25.

Industry Patents and Trademarks

2,882,140

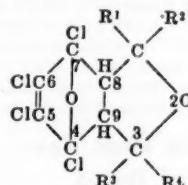
Herbicultural Compositions and Their Preparation. Patent issued April 14, 1959, to Norman E. Searle, Wilmington, Del., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del. The method for the control of weeds which comprises applying to the locus to be protected in an amount sufficient to exert a herbicultural effect, a compound of the following formula



wherein X is a radical having from 6 to 10 carbon atoms and selected from the group consisting of unsubstituted aryl and aryl ring-substituted by at least one member of the group consisting of alkyl, alkoxy, chloro, bromo, and nitro radicals; Y is a radical having a carbon content of 6-10 and selected from the group consisting of aryl, ring-substituted aryl, aralkyl, ring-substituted aralkyl, aryloxyalkyl and ring-substituted aryloxyalkyl, said ring-substituted radicals being ring-substituted by at least one member of the group consisting of chloro, bromo, and alkyl with the proviso that at least one of X and Y contain a halogen.

2,882,199

Chlorinated 4,5,6,7-Tetrachloro-4,7-Endoxo-4, 7, 8, 9-Tetrahydrophthalane Insecticides. Patent issued April 14, 1959, to Hans Feichtinger, Duisburg-Beeck, and Hans Werner Linden, Moers, Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen-Holten, Germany. Method of controlling insect pests which comprises applying composition comprising a chlorination product of 4,5,6,7-tetrachloro-4, 7-endoxo-4,7,8,9-tetrahydrophthalane having the formula



in which R¹, R², R³ and R⁴ are each a member selected from the group consisting of Cl and H at least one of R¹, R², R³ and R⁴ being Cl and at least one other of R¹, R², R³ and R⁴ being H and an insecticide carrier material to at least one insect pest in its habitat.

2,883,320

Agricultural Uses of 1,8-Dihydroxy-9-Anthrone. Patent issued April 21, 1959, to Louis G. Nickell, Port Washington, N.Y., assignor to Chas. Pfizer & Co., Inc., Brooklyn, N.Y. A process for treating plants infected with fusaria and mildews, which comprises contacting the fungi-infected plant with 1,8-dihydroxy-9-anthrone.

Industry Trade Marks

The following trade marks were published in the Official Gazette of the U.S. Patent Office in compliance with section 12 (a) of the Trademark Act of 1946. Notice of opposition under section 13 may be filed within 30 days of publication in the Gazette. (See Rules 20.1 to 20.5.) As provided by Section 31 of the act, a fee of \$25 must accompany each notice of opposition.

Eptam, in capital letters, for herbicide. Filed Sept. 22, 1958, by Stauffer Chemical Co., San Francisco. First use April 9, 1958.

Collier, in capital letters, for ammonium nitrate fertilizer. Filed Aug. 7, 1958, by Collier Carbon and Chemical Corp., Los Angeles. First use Aug. 1, 1957.

Design, tear drop shaped drawing with scroll passing through the shape with the word -Ris-Van inscribed, for liquid fertilizer. The drawing is lined for red and green. Filed Aug. 13, 1958, by Ris-Van, Inc., Belmond, Iowa. First use Oct. 1, 1955.

Dr. Daniel G. Aldrich Named Banquet Speaker

SAN MARINO, CAL.—Dr. Daniel G. Aldrich, dean, college of agriculture, University of California of Berkeley and Davis, will be the featured speaker following the banquet at El Rancho Hotel, West Sacramento, to be held in connection with the Seventh Annual California Fertilizer Conference, June 29-30. The soil improvement committee, California Fertilizer Assn., is sponsor of this annual event. Dr. Aldrich will speak on "California's Changing Agricultural Pattern."

Co-chairmen of the conference are J. H. Nelson and Earl R. Mog, both of Stockton.

This conference is expected to attract about 300 persons representative of farmers, technicians of the University of California, the state colleges, the USDA and testing laboratories, field representatives of canners, sugar beet refiners and cotton ginners, and sales, technical and management people of the fertilizer industry.

The program will embrace two important areas of fertilizer use in California—tree fruit and vine nutrition, and fertilizer placement. The assembled audience will hear addresses on these two subjects by speakers during the morning session on June 29. On the morning of the 30th, the audience will be divided into two groups for informal panel discussion of these subjects, with the panels rotating between the audiences.

The afternoon of the 29th will be devoted to a conducted tour of fertilizer research plots and greenhouse tests on the campus. The annual banquet will be held in the Rodeo Room, El Rancho Hotel, West Sacramento, at 6:30 on the evening of June 29.

Mr. Nelson and Mr. Mog said there will be no registration fee, and they invite the attendance of all persons interested in any phase of soil fertility and plant nutrition. Further information and printed programs are available from the office of the California Fertilizer Assn. at 475 Huntington Drive, San Marino, Cal.

Insecticide Plant Sold

FRESNO, CAL.—The insecticide processing plant operated by the western division of the Olin Mathieson Chemical Corp. in Fresno has been sold to De-Pester Western, Inc. The plant has been in operation for some time.



BARBARA ANN FREIE, the first girl ever to win the National Plant Food Institute Agronomy Achievement Award, is shown receiving a plaque from Dr. W. H. Pierre, head of the Iowa State College agronomy department. Miss Freie, a sophomore student in agronomy, received a scholarship for \$200 and an engraved key, while the plaque, which is inscribed with her name, remains on display at the college. Barbara was unanimously chosen as the 1959 award winner by a committee of major staff members of the agronomy department in consultation with executive officers of the student section, American Society of Agronomy. The award is based on scholarship, leadership, Agronomy Club activities and financial need.



C. B. Bagwell, Jr. C. L. (Jack) Gemmell

SALESMEN—Charles B. Bagwell, Jr. and C. L. (Jack) Gemmell have been named sales representatives for Bradley & Baker's Atlanta office. Mr. Bagwell, who has been associated with the fertilizer industry in Georgia for 10 years, will service customers in the central and northern parts of that state. He resides in Gainesville, Ga. Mr. Gemmell was formerly associated with the feed department of Bradley & Baker. He is now calling on fertilizer customers in northeastern South Carolina from his residence in New Florence, S.C.

Bitterweed Controlled by Texas Experimenters

COLLEGE STATION, TEXAS—"Bitterweed is one of the several poisonous range plants which presents a serious management problem on large areas of Texas range land," according to Dr. O. E. Sperry, professor, range and forestry department at Texas A&M College which has established practices during the last several years to control the weed.

Experimental tests from 1949 to 1951 obtained satisfactory kill with ground equipment but attempts to control by aerial application failed. Some of the reasons for failure were: treatments were made when the bitterweed was near maturity, conditions of growth as reflected by low soil moisture were not satisfactory, and the amount of 2,4-D applied was too low.

These conditions were overcome in 1958, however, and very satisfactory control was obtained. The experimental tests used helicopter, airplane and ground equipment, Dr. Sperry added.

Satisfactory results were obtained on all test plots on which a pound or more of 2,4-D an acre was applied. He said the sites which had the highest soil moisture at the time of spraying showed the greatest rates of kill.

In addition to the experimental spraying, it has been estimated that about 15,000 acres of bitterweed were treated last year. Rainfall was sufficient to create satisfactory growing conditions and as a result a good kill was obtained on most of the treated areas, he said.

There have been numerous cases of sheep poisoning by bitterweed, especially in the Edwards Plateau region. Most poisoning occurs in the winter and early spring before green range forage is available. Some cattle losses have also been attributed to bitterweed poisoning.

Bitter sneezeweed which grows abundantly in East Texas and causes a bitter taste in dairy products is sometimes confused with bitterweed, he added.

Further information on chemical weed control may be obtained from local county agents.

COTTON INSECT GUIDE

UNIVERSITY PARK, N.M.—Extension agents in New Mexico's cotton-growing counties are now distributing copies of the "Cotton Insect Control Guide" for 1959. John J. Durkin, extension entomologist with New Mexico State University, says the guide covers pre-planting controls such as soil fumigation and seed treatment, plus early and late season control with recommendations on application of various chemicals by dusts or sprays. Copies of the guide may be obtained directly from Mr. Durkin at University Park.

INSECT AND PLANT DISEASE NOTES

Pea Aphid, Alfalfa Aphid On Increase, Kansas Says

MANHATTAN, KANSAS—Pea aphids continue to increase in numbers and some alfalfa fields are showing damage. Counts as high as 100 per plant and 500 per sweep of the insect net have been reported. Parasitic wasps have been found in Riley County with 1% of aphids as mummies. Lady beetles are increasing in alfalfa but few larvae of lady beetles are present. Insecticide treatments can still result in good returns on the first cutting.

Spotted alfalfa aphids counts in north central Kansas roadbanks vary from 0-123 per 25 plants. Counts in Geary County were 1-78 per 25 plants.

A few larvae (footless green or pink grubs on leaves) were found on alfalfa in Riley County. The present wet weather will probably destroy the population with fungus disease.—Dell E. Gates and Leroy Peters.

Pea Aphids Getting Under Way in Missouri

COLUMBIA, MO.—Pea aphids are present in alfalfa and red clover over most of the state, but numbers are still light in the northern tiers of

counties. In the southwest, some fields are heavily enough infested to warrant spraying, but in most fields, this is not yet necessary. If the cool weather continues, the aphids will undoubtedly continue to increase, and spraying could be needed.

So far, very few insect parasites and predators are working on the aphids. We must have several days of warm temperatures before they can get started, and in the meantime, the aphids are continuing to build up.

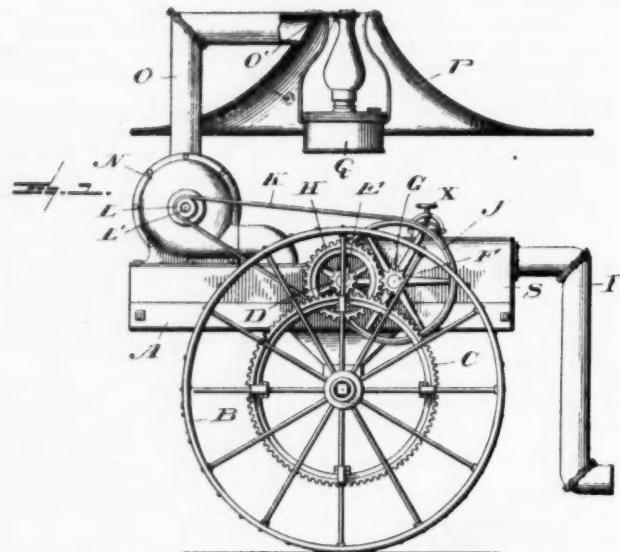
In the southwestern counties, we are finding greenbugs working on small grains and some grasses, particularly orchard grass. Although they are sometimes confused, this is an entirely different species from the aphids which infest alfalfa, but they will continue to increase in numbers if cool weather continues.

So far, we have not seen any fields of small grain which we thought needed spraying. The grain is tall enough to withstand a lot of aphid feeding, and it is hard to believe the greenbugs could possibly build up sufficiently to cause much trouble on grain this late.

On the orchard grass, it's a different story. Several fields have been, and are being, killed by these aphids.—Stirling Kyd.

Saga of Insect Pest Control

Part I*



HAVING BEHELD the boll weevil destroy cotton crops in his area of Texas season after season, Francis Strobach of Victoria, Texas sat down and invented a machine to destroy the bug once and for all. So sure was he of its success that he patented the device on Jan. 9, 1900.

Here are some of the specifications of the machine as noted in his U.S. Patent No. 640,829:

The insects would be attracted by a light (kerosene lamp) beneath a tent and then drawn by a suction of air through a pipe and deposited in a chamber where a fire is maintained for the purpose of destroying the insects.

Another feature consisted of a retort and furnace which would generate "poisonous gases" and from which "fumes may escape in contact with the vegetation on which the insects to be destroyed are located . . . When it is desired to utilize the invention for use in destroying larvae and pupae of the bugs, arsenic and sulfur or other ingredients are used in the generator and the retort is filled with charcoal which is heated by the furnace to an extreme heat and the poisonous fumes are caused by the blast of air to pass through the retort filled with the heated charcoal and thence through the discharge pipe."

As seen in the illustration, the device is not to give aid and comfort to the pests involved, but judging from the description given in the patent, it might not add greatly to the comfort and relaxation of the operator or the cotton farmer, either.

*First in a series of novel methods developed over the years for control of various agricultural insect pests. These devices have been patented in the U.S. Patent Office and illustrations are the actual ones used in the patent.

A Decade of Corn Borer Loss

Estimated losses caused by the European corn borer in the last 10 years are as follows:

1958	100,699,000 bushels	\$ 98,434,000
1957	180,897,000 bushels	158,841,000
1956	97,971,000 bushels	119,535,000
1955	155,355,000 bushels	182,579,000
1954	191,614,000 bushels	261,415,000
1953	90,000,000 bushels	125,466,000
1952	53,270,000 bushels	77,205,000
1951	35,812,000 bushels	57,438,000
1950	58,765,000 bushels	84,912,000
1949	313,819,000 bushels	349,635,000

THE ABOVE TABLE is a composite of State and Federal estimates. These estimates were prepared by using production data¹ and prices received² released by the Agricultural Marketing Service. The basis for the loss estimates was determined by the survey of corn borer populations during the fall of 1958³. The index of 3% loss per borer plant was used to compute the loss in bushels.

¹Crop Production, 1958 Annual Summary Crop Reporting Board, Agricultural Marketing Service, Dec. 17, 1958.

²Agricultural Prices as of Dec. 15, Crop Reporting Board, Agricultural Marketing Service, Dec. 31, 1958.

³Status of the European Corn Borer in 1958. Cooperative Economic Insect Report, Vol. 9, No. 5, pp. 53-62.

Alfalfa Weevil, Other Pests Reported in Georgia

ATHENS, GA.—Alfalfa weevil is now infesting alfalfa at 75 per sweep in Oconee County, 80 per sweep in Putnam County. Forsyth County now is infested with alfalfa weevil.

Light infestations of billbug on corn in Lee County, moderate to heavy infestations on corn in Lowndes and Dodge counties.

Matured larvae of plum curculio were found in peach drops in an orchard on April 20, and a few larvae began to leave the drops and enter the soil on April 22. Drops are heavily infested in some orchards, and where this is the case, growers are advised to pick them up and destroy by submerging the drops in bags in water. The curculio infestation is generally heavier than that of an average year and growers are warned not to omit any of the recommended sprays for the control of this insect.

Moderate infestations of Mexican bean beetle on beans in Lowndes, Brooks, Thomas and Grady counties, and moderate infestations of bean leaf beetle on beans in the above mentioned counties.—W. C. Johnson.

Field Mice Do \$100,000 Damage in Michigan

GRAND RAPIDS, MICH.—Michigan's recent severe winter made a field day for mice whose ravaging of fruit orchards just now is coming to light.

The disappearance of highpiled snow has revealed thousands of trees girdled by the hungry rodents.

The damage went undetected earlier since mice tunneled under the snow as they gnawed bark from the trees, many of which may be damaged beyond repair. New plantings normally are protected by metal guards, but the snow allowed mice to reach above the guards. Christmas tree plantings also were a target for the mice.

Clarence Mullett, district agricultural agent at Traverse City, conservatively estimates mouse damages to orchards at \$100,000 in an area reaching from Manistee to Petoskey. Some growers believe it will go as high as \$500,000.

Oregon Official Warns Against Witchweed

SALEM, ORE.—Witchweed, now found only in the eastern half of the U.S., could reach this area, says Hugh Taylor, plant division chief, Oregon Department of Agriculture. In Oregon, prime targets would be corn, sorghums, many grasses and some broadleafed plants, he said.

The plant is a parasite and weakens and kills by attaching itself to roots of host plants. The host plants look like drought victims; they become stunted, wilted and yellowish. Heavily infested plants die. The weed

has caused complete corn failures in some Carolina fields.

Because of the serious crop damage which results, Mr. Taylor has urged farmers and others to keep a lookout for witchweed and to report any suspected plant.

Light Infestation of Beet Leafhopper Expected

LOGAN, UTAH—Utah State University scientists predict a very light 1959 infestation of beet leafhopper, vector of curly-top disease.

"The beet leafhopper outlook, based on latest surveys of their breeding grounds in southern Utah and Nevada, is favorable to good," Howard E. Dorst, USDA entomologist, and Dr. George F. Knowlton, USU extension entomologist, have reported.

Research conducted at Utah Agricultural Experiment Station since 1946, has developed "highly reliable" forecasting techniques which predicted moderate leafhopper outbreaks in 1952 and 1955 and the heavy 1958 infestation which cost Utah tomato growers an estimated \$2 million, or 80% of their crop, Prof. Dorst stated.

California Finds New Species of Thrips

SACRAMENTO—A species of thrips new to California has been reported found on Russian thistle in Riverside County. The report was made to the California Department of Agriculture by entomologists of the University Experiment Station, Riverside.

The thrips, *Haplorthrips clarisets* Priesner, have been identified by the U.S. Department of Agriculture in Washington, D.C. The identification has been confirmed by another specialist in the Union of South Africa.

The insect has also been reported to the department as existing in the counties of San Bernardino, Imperial, Los Angeles, and Ventura. Its native habitats are Egypt, Union of South Africa, Palestine and Jordan.

The new thrips may attack lettuce, cabbage, citrus, potato, alfalfa, petunia, aster, rose, dandelion, iceplant, lambs quarter and various grasses.

Robert W. Harper, chief of the department's bureau of entomology, said: "These thrips have been identified with severe damage to lettuce in New Mexico. It is too early to say whether it will prove to be of economic importance in California. Close observation of this pest is certainly justified."

Fruits, Vegetables Threatened by Pests

NEW BRUNSWICK, N.J.—Red-banded leaf roller egg masses and moths have been reported in Burlington County. Up to 32 egg masses per tree were counted.

In strawberries, a number of insect pests pose threats. Two-spotted mites are reaching damaging proportions in untreated strawberry fields.

Spittlebugs are on the increase, but have not been observed in large enough numbers of warrant control efforts.

Cutworms are damaging in spots and may warrant attention in mulched fields. In some areas, plants are cut down to the ground and large brown worms could be found under dead leaves. Strawberry weevils were becoming more active in Hammonston late in April.—Leland G. Merrill, Jr.

Texas Wheat Fields Hit by Mites, Greenbugs

DIMMITT, TEXAS—Several wheat fields in this area have become infested with brown wheat mites, white mites and greenbugs. In some instances the mites have done more damage than greenbugs.

Some farmers have sprayed their fields for greenbugs and report good results. It isn't known how soon wheat will outgrow these insects, according to Edd C. McLeroy, farm representative of a local bank.

He says it costs \$2.50 to spray an acre of wheat, but thinks the money is well spent, providing the farmer starts treatment before the infestation becomes serious.

Fire Ants Found in Southern Arkansas Area

LITTLE ROCK, ARK.—The Arkansas Plant Board has reported that new fire ant infestations have been discovered in wide areas of Union County in the extreme southern part of the state.

Carter Seymour, head of the entomology and plant pathology division of the board, said the ants were found during an intensive survey of the county. He said this was the third year in a row that such an outbreak has occurred in the county.

Although the ants have not caused serious damage to date, Mr. Seymour said they present a problem because of the danger that they will spread to other counties. Infestations were found in 35 different sections of the county.

Mr. Seymour said the plant board and the federal plant pest control division hope to spend an estimated \$60,000 spraying 25,000 acres to eradicate the pest. While most of the spraying would be done from airplanes, areas around streams and farm ponds would be sprayed by hand—to avoid contamination of the water.

The plant board official said there was one hitch in the proposed spraying project—money. He said the federal division is willing to match state funds on a 50-50 basis, but that the plant board doesn't have available funds.

Fighting fire ants for several years, Union County sprayed about 13,000 acres in 1957 and an additional 7,500 acres last year.

Cicada Brood Due to Appear During Spring

WASHINGTON—One of the more important broods of the periodical cicada is due to appear this spring, according to the U.S. Department of Agriculture. It has occurred at 13-year intervals over much of the southern United States, extending into central Illinois and northern Missouri. The brood last appeared in 1946.

Periodical cicadas appear almost every year. There are 30 known broods, and they overlap considerably. Some live 17 years underground before emerging—the basis for the name, "17-year locust," often applied to the cicada—and some live 13 years. The expected 1959 brood is No. 19 of the 13-year variety, 1 of the 10 more important broods. The most recent appearance of an important brood was in 1957, when one of the largest of the 30 broods came out in abundance in several north central states.

The brood scheduled for this year may start appearing in early May in some southern states, showing up in cooler or higher areas later. The adults live 5 or 6 weeks. In the

past, insects of this brood have appeared in Alabama, Arkansas, Georgia, Illinois, western Kentucky, northern Louisiana, Mississippi, Missouri, North Carolina, South Carolina, Tennessee, and southeastern Virginia. Isolated findings have been made in southwestern Indiana, southeastern Iowa, and eastern Oklahoma.

Alfalfa Weevil Damage Reported in Virginia

BLACKSBURG, VA.—Heavy damage from the alfalfa weevil is being reported in infested areas of Virginia where chemicals have not been applied, says Arthur P. Morris, associate entomologist at Virginia Polytechnic Institute, here.

On the other hand, farmers who have used recommended treatments report little trouble with the weevil.

Alfalfa weevil larvae and adults have been found in clover in a few places, but damage to this crop is not expected to become heavy enough to justify controls.

Pea aphids are heavy in many alfalfa fields, and some farmers have started spraying.

Armyworm outbreaks are expected in some counties within the next two weeks, and farmers are advised to keep a close watch for them. Stored grain pests are becoming more active. Mr. Morris says this is a good time to clean up emptied bins to get ready for new grain crops, and to take steps to protect supplies of feed during the summer months.

Indiana Reports More Insect Pest Activity

VINCENNES, IND.—The plum curculio merits vigilance on the part of growers. Seventy adults were jarred from 5 unsprayed trees on April 20; 87 were collected on 5 trees on April 27.

Tarnished plant bug activity has fallen off sharply, while stink bug populations continue to build up.

All egg masses of the red-banded

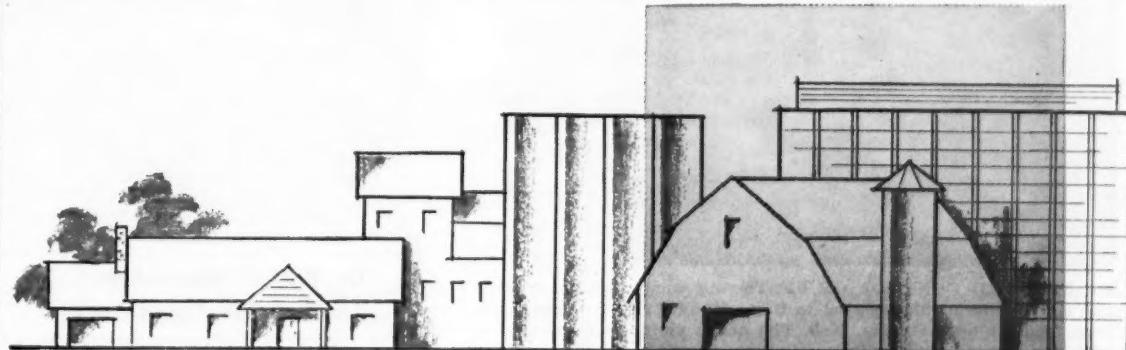
leaf roller examined had hatched (April 27). This insect bears close watching. Egg masses were quite plentiful.

About 63% of the over-wintering codling moth larvae have pupated.

Indications are that the European red mite pressure is going to be great in this area this season. Conditions are quite different from last spring when mite development was slow. With about 75% of the overwintering eggs hatched, populations range up to about 300 mite nymphs per 100 leaves.—Merrill L. Cleveland.

WASHINGTON DEALER

BURLINGTON, WASH.—A new garden supply store has opened its doors to the homeowners of this area. It is the result of an expansion program by J. W. Feed Co. of Sedro-Wooley and Burlington. The new unit is owned by Walter Van Horne and managed by Clarence Bode. Complete lines of home garden supplies, bedding plants and nursery items will be carried the year round.



**When SAFETY is
just as important as
EFFECTIVE CONTROL...**

Penick Botanical Pesticides!

These economical botanicals enable you to formulate a broad range of profitable pesticides for home, farm, and industrial use. They're highly effective, with no resistant strain development. All are safe to use . . . all non-phytotoxic.

When you deal with Penick you benefit by our long experience as the world's largest botanical house. Quality is the highest, steady supply assured and shipments are always made promptly.

We'll be glad to suggest starting formulations and recommend application procedures for specific end-uses.

POWDERED CUBE

BRITTLE EXTRACT OF CUBE

LIQUID EXTRACT OF CUBE

POWDERED PYRETHRUM FLOWERS

SYNERGIZED PYRETHRUM EXTRACTS

PYRETHRUM EXTRACTS

CALCINED SABADILLA

POWDERED RYANIA

**New! For economical
control of codling moth . . .
right up to harvest . . .**

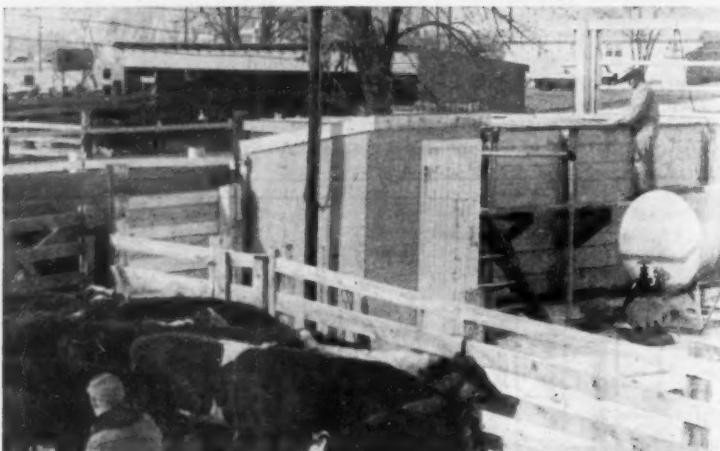
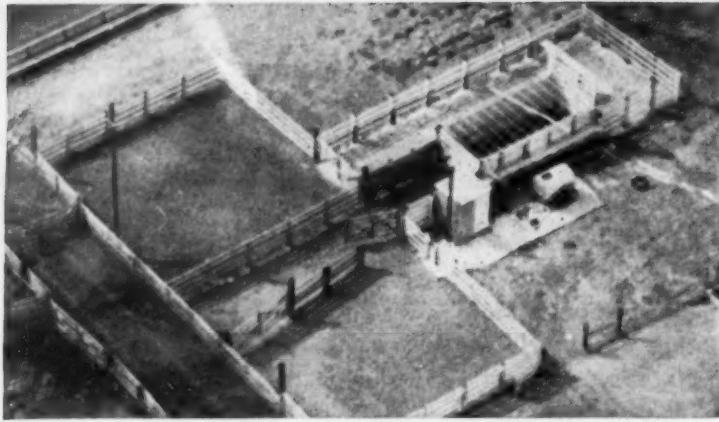
RYANICIDE 50 W.P.

This recently developed wettable powder provides all the benefits of Ryania at new lower cost! Same selective control . . . encouragement of beneficial species . . . no resistance . . . no harmful residues! For data, write Penick.

PENICK

Farm Chemical & Insecticide Division

S. B. PENICK & COMPANY • 100 CHURCH ST., NEW YORK 8 • 735 W. DIVISION ST., CHICAGO 10



MECHANIZED CONTROL OF PESTS—As many as 3,000 head of cattle a day can be thoroughly sprayed in these facilities, part of the A. E. Ruser & Sons feed lot near Omaha, Neb. The aerial view, above, shows the holding pens, the spraying unit with nozzle pipes showing and the route the animals take (counter clockwise) from holding pen at lower right through sprayer, to holding pen at upper left. From this point, the cattle are let into the feed lot proper. Below is a closeup of the spraying area with operator standing by enclosure where the actual application is made. Enclosure permits spraying of from 18-20 head of cattle at a time.

Mechanical Sprayer Handles 3,000 Head of Cattle a Day In Nebraska Feedlot Facility

OMAHA, NEB.—Positive control of animal parasites is not only desirable, but an economic "must" in a large feed lot operation, according to A. E. Ruser & Sons who operate two feedlots in the Omaha area. They have found, further, that an elaborate setup for quick and thorough application of pesticides on large numbers of cattle is a paying proposition.

A complete spraying unit is one of the main features of the operation. It is thoroughly mechanized so it goes into operation at the mere touch of a button. It is so efficient that it can handle 3,000 head of cattle a day, treating the animals with standard toxicants for control of flies, lice and other parasites.

The owners report their standard spray consists of mixtures of chlordane and DDT at varying dosages depending upon the situation.

The owners sprayed about 4,000 head with Co-Ral last fall, they report. The mixture was 16 lb. toxicant to 100 gal. water, with about 1 gal. solution applied per animal. Nozzle pressure is best at from 200-250 lb., they say. Figuring on their volume basis, the owners report that treatment for grubs comes to about 80-90¢ a head, applied.

The spray pen is 12 by 20 ft. with high sides and gates on both ends. There are 13 rows of nozzles above the pen and the same number imbedded in the plank floor. Nozzles are mounted 17 in. apart along $\frac{3}{4}$ in. pipe which is fed by a 2-in. pipe coming from a 20 h.p. Fairbanks centrifugal pump having a 3-in. suction discharge. The 550-gal. tank has a 1 h.p. agitator to keep the water-chemical mixture in complete suspension.

Two men bring an entire pen of 250-300 cattle into holding pens, then move the cattle through the sprayer setup as fast as the operator can push the button. This takes only 7 seconds with the DDT spray, and each pen of 18-20 head can get its proper over-and-under dose of Co-Ral in about 12 seconds. Rusers feel their insect control methods have paid off many times over in more dependable gains on cattle that come to the feed lot from all types of country and housing.

Chemical Specialties Group Names Meeting Speakers

NEW YORK—The 45th Midyear Meeting of the Chemical Specialties Manufacturers Assn. will be held at the Drake Hotel, Chicago, May 18-20.

Among the guest speakers will be William C. Stolk, president of the American Can Co.; James Q. du Pont, E. I. du Pont de Nemours & Co.; James K. Langum of Business Economics, Inc., Chicago, and Larry Le Sueur, CBS news analyst.

The meeting will hear reports from Donald M. King of the Masury Young Co., Boston, association president; P. C. Reilly, Reilly Tar & Chemical Corp., Indianapolis, treasurer, and H. W. Hamilton, executive secretary.

A principal feature of the convention will be technical sessions conducted by the association's six divisions: aerosol, automotive; disinfectant and sanitizers; insecticides; soap, detergents and sanitary chemical products; and waxes and floor finishes.

Biological Sciences Meeting Dates, Plans Announced

UNIVERSITY PARK, PA.—The American Institute of Biological Sciences and seventeen member biological societies will hold their annual meetings Aug. 30 to Sept. 3 at the Pennsylvania State University where Dr. R. E. Larson, head of the department of horticulture, is chairman of arrangements. Some 3,500 delegates are expected to attend from all parts of the U.S., Puerto Rico, Canada, Mexico and many other countries.

Dr. Wallace B. Fenn, Rochester University, will address a general session of the AIBS on the evening of Aug. 31. The rest of the time will be given over to meetings of member societies. They include:

American Phytopathological Society, American Society for Horticultural Sciences, American Society of Parasitologists, American Society of Zoologists, Ecological Society of America, Genetics Society of America, National Association of Biology Teachers, Society for Industrial Microbiology, and Society of Protozoologists.

Prior to the convention the American Society for Horticultural Sciences, will have a special tour through southeastern Pennsylvania. This is being sponsored by the Penn State department of horticulture and its agricultural extension service in cooperation with numerous horticultural and related industries in the state.

Dr. Paul C. Mangelsdorf To Dedicate Laboratory

NEW HAVEN, CONN.—Dr. Paul C. Mangelsdorf, formerly assistant geneticist on the staff of the Connecticut Agricultural Experiment Station, will be one of the principal speakers at ceremonies planned for the dedication of Slate Laboratory of the station on June 9. Dr. Mangelsdorf, director of the Botanical Museum at Harvard University, is an authority on genetics of corn and on the origin of cultivated plants.

The name Slate Laboratory recognizes the contribution to the station of William L. Slate of Hamden, director emeritus. Mr. Slate became vice director a year after Mr. Mangelsdorf came to the station in 1921 and was director for five of the seven years before the distinguished geneticist began a 13-year period of service in Texas. Dr. Mangelsdorf will speak on Mr. Slate as a colleague and administrator.

The station will hold an open house at 123 Huntington Street, New Haven, on the same day, June 9, from 1 to 8 p.m. Exhibits and demonstrations in all departments will give visitors an opportunity to see how scientists work.

The staff in entomology, for example, plans to show 16 different displays or demonstrations, ranging from systemic insecticides on poinsettia to effects of chemicals on insect nerves and muscles.

Oregon's Aerial Spraying Group Ups Membership

SALEM, ORE.—Eastern Oregon wheat farmers are relying more and more on aerial spraying to kill weeds, reports Ray Kelso, herbicide control supervisor for the Oregon State Department of Agriculture.

This is evident in the increased number of air operators licensed to apply chemical weed killers, he points out. The department at mid-April had licensed some 105 air farm sprayers in comparison with 85 last year at this time.

There are 160 ground operators, about the same as last year with dropouts cancelling new applicators.

Most of the licensed air sprayers work east of the mountains with most of the ground operators working on the western side.

U.S. Court Decides Trade Secret Suit

POCATELLO, IDAHO—A suit brought by Monsanto Chemical Co., St. Louis, against Central Farmers Fertilizer Co., Chicago, in which Monsanto charged illegal use of its trade secrets, was concluded here April 24 when Judge Fred M. Taylor of the U.S. District Court signed an injunction consented to by both parties.

Under the terms of the court order, Central Farmers was permanently prohibited from disclosing certain process information and other technical data which Monsanto claimed as its trade secrets. The injunction further forbids Central Farmers' using the aforementioned data for a period of 10 years at any of its plants except the presently constructed Central Farmers facilities at Georgetown, Idaho, which are not affected by the decree.

In announcing the terms of the consent decree, Joseph J. Lanter, president of Central Farmers, and Charles Allen Thomas, president of Monsanto, said that each company would assume its own costs in the proceedings and that no damages or money payment was provided for in the settlement.

The case was related to a court action by Monsanto against a former employee, Charles M. Miller, who subsequently became an employee of Central Farmers. Monsanto charged Mr. Miller with illegally taking process information, blueprints and other trade secrets relating to its elemental phosphorus operations and making this information available to Central Farmers. A permanent injunction was obtained against Mr. Miller last year which prohibited his use and disclosure of this material.

The Central Farmers case was filed in the District Court for Idaho last February, since the Miller case was not binding against Central Farmers.

Ragweed, Wheat Rust Search to be Increased

SALEM, ORE.—Oregon will widen the scope of ragweed surveys this year and in the process will gather new information on the wheat stem rust situation here, reports the State Department of Agriculture.

Key to the dual studies will be pollen trapping stations the department is setting up at Sherwood, Eugene, Klamath Falls, Grants Pass, Medford, Roseburg, Corvallis, Union, Baker, Hood River, Umatilla, Ontario, Burns, John Day, Redmond, Pendleton, Bonneville, The Dalles and Lexington. A part-time station will function at Cave Junction.

Most of the stations are now in operation. Information gained from three other stations, maintained by the American Academy of Allergy at Portland, Salem and Milton-Freewater, will be added to the new pool, according to George Moose, department ragweed supervisor.

A "trapping station" consists of two 9-in. disks arranged $3\frac{1}{2}$ in. apart and mounted on a 39-in. pedestal; microscope slides, greased to catch pollens, are placed between the disks. Stations are mounted on the highest point in the locality. Slides will be changed three times each week.

Oregon State College is cooperating in the survey and will prepare and read the slides for ragweed, other allergenic pollens and wheat stem rust spores.

Bill B. Mainord Joins Federal Chemical Co.

DANVILLE, ILL.—Bill B. Mainord has joined the sales management team of Federal Chemical Co. at Danville, where he will assist Roy Nethery, division sales manager.

Mr. Mainord is a graduate of the University of Missouri, 1949, and for the past 10 years was associated with the Missouri Farm Bureau Federation.

Social and Political Implications of Integration

"Those who manage our agricultural production, processing and distribution firms are challenged to give intelligent direction to the changes ahead . . ."

By Dr. Earl L. Butz
Purdue University

Vertical integration in agriculture is the result of fundamental economic and technological changes occurring in the agricultural industry—not the cause of them. It is a manifest effort by individual sectors of the agri-business assembly line to survive in the swift competitive current of our modern dynamic food and fiber industry.

Agriculture is in the midst of a far-reaching scientific and technological revolution which is shaking the very foundations of its traditional institutional patterns.

Agriculture is changing from a way of living to a way of making a living. It is changing from a business of arts and crafts to a business undergirded with large amounts of science and technology.

The industrial revolution of the past half century by-passed much of agriculture. The agricultural industry, even though mechanizing and increasing its output per worker remarkably, still remained organized typically around the relatively small entrepreneurial family-type unit. In this respect the industry was, and still is, fairly unique among the major industries of America.

A large number of these individual units—perhaps more than half of them—are so small or so inefficient as not to yield their operators a living standard generally regarded as adequate. Yet they have survived, one way or another. The traditional institutional pattern of owner-operator, combined in a single person, has not been seriously challenged by developments associated with the industrial revolution.

The present agricultural revolution, resting on basic science and closely allied with the widespread advance of automation in both production and distribution, is threatening the traditional pattern of owner-manager-operator all wrapped up in a single person.

This is the very basis for much of today's social and political unrest in agriculture.

The fact that vertical integration is one of the stage properties being used by science, by technology, and by automation places it under political suspicion as the villain in the act.

FACETS OF AGRICULTURAL ADJUSTMENT: There are five fundamental characteristics of the current agricultural adjustment which bear on the problem under discussion. All five of them are more applicable to the broiler industry than to many other types of agriculture. They will merely be listed here, with minimum comment.

1. Capital requirements per farm and per worker have increased to the extent that it is becoming increasingly difficult for an individual, during his productive years, to accumulate a sufficient amount to finance an economically-sized operating unit. This will become increasingly true in the decades ahead. Moreover, in view of the inheritance tax structure, it is becoming increasingly difficult for a parent to transfer such a unit to his son without substantial operating or financial disruption.

2. Management has become the key factor in successful farm operation. This is in sharp contrast to a generation or two ago, when the farm unit was much more self-sufficient than now, with much less capital involved, with less science applied, and with many fewer critical managerial decisions to be made.

3. The trend toward larger and fewer commercial farm units will con-

tinue. This trend has been pronounced during the past decade. It will accelerate in the decade ahead. All the power of government and politics can't stop it. Nor should it.

4. The commercial farm will increasingly assume the characteristics of a manufacturing establishment, with the manager assembling "packages of technology" which have been produced by others on a custom basis. The share of total farm receipts spent for production items will increase still further, the gross margin per dollar of receipts will become narrower, and profits will depend increasingly on growing volume.

5. The process of "Urbanization" will accelerate. Rural and urban cultures will intermingle in countless communities within commuting distance of industrial centers. A new community culture will emerge in which the farmer will tend to lose his vocational identity, just as the lawyer, the doctor, or a machinist now loses his in his own community.

SOCIAL IMPLICATIONS OF INTEGRATION: The social implications of these changes may be grouped under four general headings.

1. There will be growing pressure on the combination of owner-manager-operator in one man, as the typical institutional pattern of farm operation.

We have departed from this pattern in the majority of other major business sectors of America. Time was we had many family entrepreneurial foundry shops, tailor shops, bootmakers, corner grocery stores, and yes, even automobile assembly plants. These have given way, in the main, to larger units, with more capital, with higher levels of management, with more specialization of labor, and, if you choose, with a higher degree of integration.

In the main, when such changes have occurred, opportunities for profit and for higher living have increased for owners, for managers and for workers. Some individuals were injured in the adjustment, but on the whole, society gained.

Many family commercial farms today have total capital investment exceeding \$100,000. It's not uncommon to have capital investment approaching or exceeding \$200,000 on family commercial farms in the Corn Belt.

It's not necessary to dwell at length on the difficulty of passing such a unit intact from father to son, without pausing at least to catch one's breath as he passes the tax collector.

Moreover, if the son has to face the prospect himself of getting on top of this kind of capital structure, perhaps by paying off two or three other heirs in the family, he may choose to spend more of his current income in living and less in saving, than his father before him chose to do. This means that he will be not only willing, but anxious, to enter into some kind of financial arrangement whereby a third party puts up some of the capital, or perhaps becomes a financial partner, on a permanent basis, at the time of father's death.

Managerial capacity is even more difficult to pass from father to son than is accumulated capital. Management is now the critical factor in successful farm operation. And this means a highly specialized kind of management.

Fathers do not necessarily breed managerial capacity into their sons. A generation or two ago it was not difficult for son to apprentice under father, and take over the family farm, provided son had a strong constitution and a propensity for hard physical work. The latter factors are no longer limiting. The limiting factor now is managerial capacity.

It is equally true that fathers don't necessarily breed vocational preference into their sons. With the growing tendency for farm youth to be educated beyond the high school, many farm-reared youngsters will have their vocational preference tipped away from the "three-in-one" farmer their father was. They might prefer to train themselves for manager, for manager-operator, for part-owner-operator with some "integrator" supplying part of the capital and part of

EDITOR'S NOTE: In this article the author looks into the future of an integrated agriculture, and presents in detail his views of how integration might alter the industry economically, socially and politically as well. For suppliers of the farm industry, the article contains some important food for thought. Dr. Butz is dean of the school of agriculture at Purdue University. The material in this article was presented by Dr. Butz as an address at the National Broiler Industry Conference.

the management, or for some combination of these.

The point is that these economic pressures in modern agriculture make the field ripe for integration to manifest itself. But the critic of the change will often mistake the process of integration as the cause of the change.

2. The second implication of the changing times is that our typical system of fee simple ownership by individual operators will be under increasing pressure. This is a logical deduction from the analysis in the preceding paragraphs.

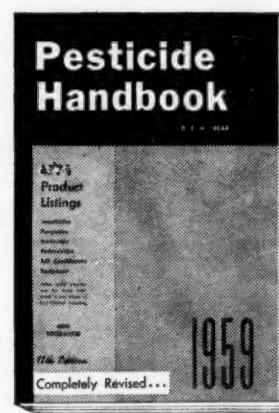
The typical cycle of farm ownership and operation under our present system of fee simple ownership by individuals is essentially the life cycle of an individual. In the main, our farms need to be rather completely refinanced each generation.

But still more important, with the process of refinancing, usually comes a shift in management and operation. This is seldom accomplished without considerable disruption of the farm as a going concern. This disruptive process in transfer will increase as the size of unit grows, as financing becomes more difficult and as the importance increases of maintaining a unit large enough to be economically efficient.

Industry has met this problem by having divisible shares of ownership which in many cases are not even remotely related to management or to operation. This permits passing ownership from one generation to the next without disrupting management or operation. This permits the accumulation under single management and single operation, or under single management and multiple operation, of units so large as to be beyond the capacity of the ordinary individual to accumulate in his productive years, and yet large enough to attain the economics associated with scale of operation. The pressure is in this direction in commercial agriculture.

(Turn to INTEGRATION, page 18)

NOW REPORTING ON 7,041 TRADE NAMES



1.75 250
Cloth Bound Edition ea. \$3.25
Postage included on prepaid orders
Send Today
PESTICIDE HANDBOOK
P. O. Box 798
State College Pennsylvania

NEW EDITION
NOW AVAILABLE

AN IMPORTANT BOOK FOR THOSE
INTERESTED IN ANY PHASE OF
PEST CONTROL

County agents, extension and research specialists, manufacturers, salesmen, jobbers, dealers, purchasing agents, health officers, farmers and librarians have found this publication to be extremely useful time and time again. **Pesticide Handbook** is the ONLY book giving complete up-to-the-minute information on over 7,041 commercial products, completely indexed by trade names, active ingredients and manufacturers.

at your fingertips

You'll find a wealth of information on fungicides, insecticides, rodenticides, adjuvants, diluents, compatibilities, antidotes, and pest control equipment. New tolerances are listed.

about the editor

Dr. Donald E. H. Frear, Editor of PESTICIDE HANDBOOK 1959, is one of the leading authorities on the chemistry of pesticides. He is the author of "Chemistry of Insecticides and Fungicides," the first book dealing with this subject published in the United States. In addition, he has written several other books, including "Chemistry of Insecticides, Fungicides and Herbicides." Dr. Frear is Professor of Agricultural and Biological Chemistry at the Pennsylvania State University.

Proposed Amendment Includes Additional Products Under Federal Insecticide Act

—See Story on Page 1—

WASHINGTON—Here is the text of H.R. 6436, a bill to amend the Federal Insecticide, Fungicide, and Rodenticide Act so as to include nematocides, plant regulators, defoliants and desiccants, as introduced by Harold D. Cooley (D., N.C.), chairman of the House Agriculture Committee:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Nematocide, Plant Regulator, Defoliant, and Desiccant Amendment of 1959."

Sec. 2. (A) The Federal Insecticide, Fungicide, and Rodenticide Act (61 Stat. 153; 7 U.S.C. 135-135k) is amended so that sections 2a and 2d read as follows:

"a. The term 'economic poison' means (1) any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any insects, rodents, nematodes, fungi, weeds, and other forms of plant or animal life or viruses, except viruses on or in living man or other animals, which the Secretary shall declare to be a pest, and (2) any substance or mixture of substances intended for use as a plant regulator, defoliant or desiccant.

"b. The term 'device' means any instrument or contrivance intended for trapping, destroying, repelling, or mitigating insects or rodents or destroying, repellent, or mitigating fungi, nematodes, or such other pests as may be designated by the Secretary, but not including equipment used for the application of economic poisons when sold separately therefrom."

(B) Section 2 of such Act is further amended by redesignating subsections g through u to be subsections 1 through 2 respectively; and by adding new subsections g, h, i, j, and k, and amending new subsections p and z, to read respectively as follows:

"g. The term 'nematocide' means any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating nematodes.

"h. The term 'plant regulator' means any substance or mixture of substances, intended through physiological action, for accelerating or retarding the rate of growth or rate of maturation, or for otherwise altering the behavior of ornamental or crop plants or the produce thereof, but shall not include substances to the extent that they are intended as plant nutrients, trace elements, nutritional chemicals, plant inoculants, and soil amendments.

"i. The term 'defoliant' means any substance or mixture of substances intended for causing the leaves or foliage to drop from a plant, with or without causing abscission.

"j. The term 'desiccant' means any substance or mixture of substances intended for artificially accelerating the drying of plant tissue.

"k. The term 'nematode' means invertebrate animals of the phylum nemathelminthes and class nematoda, that is, unsegmented round worms with elongated, fusiform, or sac-like bodies covered with cuticle, and inhabiting soil, water, plants or plant parts; may also be called nemas or eelworms.

"p. The term 'active ingredient' means—

"(1) in the case of an economic poison other than a plant regulator, defoliant or desiccant, an ingredient which will prevent, destroy, repel, or mitigate insects, nematodes, fungi, rodents, weeds, or other pests;

"(2) in the case of a plant regulator, an ingredient which, through physiological action, will accelerate or retard the rate of growth or rate of maturation or otherwise alter the behavior of ornamental or crop plants or the produce thereof;

"(3) in the case of a defoliant, an ingredient which will cause the leaves or foliage to drop from a plant;

"(4) in the case of a desiccant, an ingredient which will artificially accelerate the drying of plant tissue.

"z. The term 'misbranded' shall apply—

"(1) to any economic poison or device if its labeling bears any statement, design, or graphic representation relative thereto or to its ingredients which is false or misleading in any particular;

"(2) to any economic poison—

"(a) if it is an imitation of or is offered for sale under the name of another economic poison;

"(b) if its labeling bears any reference to registration under this Act;

"(c) if the labeling accompanying it does not contain directions for use which are necessary and if complied with adequate for the protection of the public;

"(d) if the label does not contain a warning or caution statement which may be necessary and if complied with adequate to prevent injury to living man and other vertebrate animals, vegetation, and useful invertebrate animals;

"(e) if the label does not bear an ingredient statement on that part of the immediate container and on the outside container or wrapper, if there be one, through which the ingredient statement on the immediate container cannot be clearly read, of the retail package which is presented or displayed under customary conditions of purchase: Provided, That the Secretary may permit the ingredient statement to appear prominently on some other part of the container, if the size or form of the container makes it impracticable to place it on the part of the retail package which is presented or displayed under customary conditions of purchase;

"(f) if any word, statement, or other information required by or under authority of this Act to appear on the label or labeling is not prominently placed thereon with such conspicuity (as compared with other words, statements, designs, or graphic matter in the labeling) and in such terms as to render it likely to be read and understood by the ordinary individual under customary conditions of purchase and use; or

"(g) if in the case of an insecticide, nematocide, fungicide, or herbicide when used as directed or in accordance with commonly recognized practice it shall be injurious to living man or other vertebrate animals, or vegetation, except weeds, to which it is applied, or to the person applying such economic poison; or

"(h) if in the case of a plant regulator, defoliant, or desiccant when used as directed it shall be injurious to living man or other vertebrate animals or vegetation to which it is applied, or to the person applying such economic poison: Provided, That physical or physiological effects on plants or parts thereof shall not be deemed to be injury, when this is the purpose for which the plant regula-

tor, defoliant, or desiccant was applied, in accordance with the label claims and recommendations."

Sec. 3. This Act shall take effect on the date of its enactment, except that—

(a) with respect to any nematocide, plant regulator, defoliant, or desiccant which was marketed commercially prior to the date of enactment and whose use does not result in residues of same remaining in or on a food, and with respect to any nematocide, plant regulator, defoliant, or desiccant whose use does result in residue remaining in or on a food at the time of introduction into interstate commerce and which use had commercial application prior to January 1, 1958, section 3, "Prohibited Acts"; section 8, "Penalties"; section 9, "Seizures"; and section 10, "Imports," of the Federal Insecticide, Fungicide, and Rodenticide Act, which this Act amends, shall not be applicable until—

(1) March 5, 1960, or such later date, not beyond March 5, 1961, as the Secretary of Agriculture may prescribe on the basis of a determination that such action will not be unduly detrimental to the public interest and is necessary to avoid hardships, or

(2) the date on which a registration for such use is issued under the Federal Insecticide, Fungicide, and Rodenticide Act, whichever date first occurs; and commercial use of a nematocide, plant regulator, defoliant, or desiccant, if such use was made of such substance before January 1, 1958, clause (2) (B) of section 402 (a) of the Federal Food, Drug, and Cosmetic Act, as amended (21 U.S.C. 342), shall not apply until—

(1) March 5, 1960 or at the end of such additional period, not beyond March 5, 1961, as the Secretary of Health, Education, and Welfare may prescribe on the basis of a finding that such extension involves no undue risk to the public health and that conditions exist which necessitate the prescribing of such an additional period, or

(2) the date on which an order with respect to such use under section 408 of the Federal Food, Drug, and Cosmetic Act, as amended (21 U.S.C. 348), becomes effective, whichever date first occurs.

CORN BORER

(Continued from page 1)

Iowa, Nebraska and Illinois. In Iowa, 40½ million bushels of the crop were lost. Nebraska lost about 23 million bushels and Illinois, 14 million bushels.

The figures are a composite of state and federal estimates based on surveys made during the fall of 1958. Entomologists figure that each borer found on a plant cuts its production 3%.



DISCUSSING a National Plant Food Institute-supported study in California, left to right, are: Douglas Kleist and Luverne Donker, research workers; Dr. Orville Thompson, University of California department of education, who is directing the study, and Dr. Richard Bahme, NPFI western regional director. The study, financed by a \$2,500 NPFI grant, is aimed at determining who makes the decisions about using fertilizer on California farms.

WEED CONTROL PAYOFF

STATE COLLEGE, MISS.—Chemical weed control is paying off in a big way this year, says W. R. Thompson, extension agronomist. "I saw some demonstrations on pasture weed spraying in Washington County," he said. "On these demonstration plots supervised by G. A. Vanderford, associate county agent at Greenville, the areas sprayed with 2,4-D are completely weed-free. Areas not sprayed and kept as a check had weeds knee-deep on them."

Spring weeds are at their best (or worst) right now, Mr. Thompson pointed out. It is easy to see how much good grazing the weeds displace.

But these weeds still do not damage pastures as much at this season as later in the year because more good grazing plants are now growing.

Rain Scarcity Hurting California Farming

SACRAMENTO—Lack of spring rainfall is being keenly felt in many sections of California and in some instances crop damage already has occurred.

Winter grain crops in the southern portion of the state already are seriously deteriorated, according to reports reaching the California Department of Agriculture. In the northern portion of the state barley and wheat growers report many fields headed out well although somewhat early. The chances of grain filling out well are declining and some ranchers say there is a strong probability of definite damage such as pinched heads.

The movement of livestock to irrigated pastures and high altitude summer ranges is well under way as a result of the drying up of short winter ranges. The California Crop and Livestock Reporting Service says summer ranges are in good shape only in the northwestern coastal counties. Feed is short in the Sacramento Valley and much below normal in the northeastern section of the state.

Spring planted crops such as sugar beets, milo, corn and tomatoes were reported progressing well. The first cutting of alfalfa hay is nearly completed with quality reported good.

Irrigation, both on field crops and in fruit and nut orchards, is being carried on a month or two early. Fruit and nut growers are reported satisfied with weather conditions, however, and heavy sets of peaches, pears and almonds are noted.

Hurley Fellows, 67, USDA Pathologist, Dies in Kansas

MANHATTAN, KANSAS—Hurley Fellows, 67, a U.S. Department of Agriculture plant pathologist, died at his home here recently.

Mr. Fellows originally joined the USDA at the University of Wisconsin but had been stationed in the Kansas State University department of botany and plant pathology since 1925.

He worked for many years on the root rot and foot rot disease in wheat, and the Septoria leaf blotch of wheat, but for the past 10 years had devoted his efforts to wheat streak and soil borne mosaic studies.

He was the author of more than 40 bulletins and technical articles.

Sunnyside Co-op Organized

SUNNYSIDE, WASH.—A non-profit agricultural land owners' cooperative to be called the Mid-Roza Association Co-op. has been formed here, according to incorporation papers filed in the Yakima, Wash., county auditor's office.

Papers state the Sunnyside organization will deal in fertilizing material and farmer supplies.

The first board of directors was listed at Donald Miller, Carl Schrader, Fred Tupp, Carl Dunning and George Schroder, all of Sunnyside.

Test Plots Help Dealer Sell More Fertilizer

By RUEL McDANIEL
Croplife Special Writer

Working closely with county agents in the selection of test plots on average area farms for use in proving up the value of fertilizers and seeds has been the major contributing factor in building a profitable fertilizer business for Victoria Farm & Ranch Supply, Victoria, Texas.

"The best possible argument in favor of the fertilizers we recommend," explains A. L. Breed, Sr., head of the company, "is growing proof. When a farmer and his neighbors see the same crop planted side by side, one area fertilized and another not, there is no need to argue the merits of fertilizers. Prospects see for themselves."

County agents in the area served by the company carry on a continuing program of testing seeds, crops and fertilizers, to show farmers best routine for greatest production and return on the money invested; and because Mr. Breed and his son, A. L. Breed, Jr., know farming as well as fertilizers, the county agents are glad to have their help and advice in carrying out test projects.

County agents select plots on specific farms where tests are to be made, the location plots being determined on the basis of need and variety of soils and farming conditions. Enough such plots are designated to provide tests in nearly all varieties of soil and under nearly all farming conditions of the area.

When the plots are designated and the soil is ready for treatment, the company furnishes not only the fertilizers it recommends but the seeds to be used in the tests.

Mr. Breed talks over with the county agents the various fertilizers, their ratios and quantities, for each plot, and generally the county agents go along with the Breed recommendations.

Once a plot is fertilized and seeded, it receives a designation and number and it is watched closely not only by the county agents but also by the owners of Victoria Farm & Ranch Supply, the farmer on whose acreage the test plot is located and the farmer's neighbors.

There is an accurate record of the amount and components of fertilizers used on each plot, the date they were applied and the conditions under which the crop was grown, particularly relating to moisture and cultivating methods.

"By these test plots we not only educate farmers in the proper use of fertilizers but we learn a lot ourselves," Mr. Breed points out. "By varying the formulas for various plots and different crops, we are able to determine exactly what formulas and amount of fertilizer produce the maximum returns on the fertilizer investment on specified types of soils and in growing specific crops. With that information we may alter our own recommendations and can be assured that we are selling each customer the fertilizer and formulas

that will give him the most for his fertilizer dollar."

The company moves about 15 carloads of fertilizer annually, and sales are mainly to row-crop farmers.

The company also has added to its net profit on fertilizer sales by adopting a strictly cash basis of payment, with the exception of regular customers who have been buying on a 30-

(Turn to TEST PLOTS, page 15)

A. L. BREED, JR., of the Victoria Farm & Ranch Supply, Victoria, Texas, writes up a fertilizer order for one customer as another prospect observes.



Advertising a Must, Not a Maybe for Successful New Mexico Store Owner

By JESS F. BLAIR
Croplife Special Writer

In building an annual business of more than a quarter million dollars, Ervin Mitchell of Roswell, N.M., has spent a sizeable budget on advertising. And it has brought money back to him.

As owner and manager of Mitchell's Seed & Grain Co., he has kept records on various types of advertising. One successful medium was a monthly news letter which he sent out to hundreds of customers. Sprin-

kled with farm and ranch happenings and filled with humor, the letter was eagerly awaited in many rural homes.

He used it to advertise the store's products and services. When he put in a pellet mill and also a roller mill, both machines were kept busy through radio solicitations.

In speaking of his various advertising methods, Mr. Mitchell explained their merits and drawbacks.

"We discontinued the news letter,"

he said, "not because it was ineffective, but because of the expense. A good news letter costs money; also it is limited when you need to push something seasonal. The radio is quicker and more effective if you have an audience. I'm sure TV is the best of all media, if it is priced at a level where a mortgage does not have to be placed on the store for a half hour a week."

"We now use 15 minutes on the radio from 6:15 to 6:30 a.m.," he continued, "and have stepped it up to three times a week. Our program is beamed over a 5,000 watt station, which reaches out 300 miles from Roswell. We give livestock markets, local when available, and give as much news about local ranchers and farmers as possible."

Mr. Mitchell prefers an early morning program when farm families are eating breakfast and before the TV is turned on. One thing unknown to some dealers is that radio rates are not based on the station's power.

"Beware the underpower station that charges standard rates," he said. "In one town I know there are three radio stations. Two of them have only 250 watts of power, the third has 5,000 watts, yet rates are the same on all three. It's just like paying the same price for an ad in the Podunk Register as you would in the New York Herald."

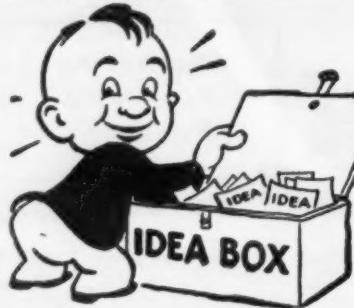
Mr. Mitchell says the owner should devise his own advertisements and programs. This gives the store a certain identity and spotlights the owner's individuality and policies.

"I wrote the news letter myself," he said, "and I also do my own announcing. Don't worry about not being a trained speaker. A corny voice does not matter. It makes a change of pace from the usual run of professional announcers' voices, and may even be a relief for the listeners. At least

(Turn to ADVERTISING, page 13)



DISPLAYING FERTILIZER AND INSECTICIDES in an attractive manner is often a difficult task. At the McMurtry Seed & Fertilizer Co., Ft. Collins, Colo., all products are arranged for both eye appeal and convenience of customers. Here is an example of how the store has displayed large cans of insecticides to give the most pleasing effect. The display is near the rear wall of the room and just a few feet to one side of the cash register. The firm specialized in fertilizers and insecticides for several years, but is now selling garden and field seeds to increase sales during the off seasons of the year.



What's New...

In Products, Services, Literature

You will find it simple to obtain additional information about the new products, new services and new literature described in this department. Here's all you have to do: (1) Clip out the entire coupon and return address card in the lower outside corner of this page. (2) Circle the number of the item on which you desire more information. Fill in your name, your company's name and your address. (3) Fold the clip-out over double, with the return address portion on the outside. (4) Fasten the two edges together with a staple, cellophane tape or glue, whichever is handiest. (5) Drop in any mail box. That's all you do. We'll pay the postage. You can, of course, use your own envelope or paste the coupon on the back of a government postcard if you prefer.

No. 6902—Trailer Sprayer

A new "MinIowa" model dual X15 trailer sprayer is being introduced by Ferguson Enterprises. The unit, which incorporates a multiple assembly design, was developed to permit the boom to be mounted either in front or behind the axle, subject to need or preference. The multiple assembly feature also makes it possible



to mount the tank crosswise or lengthwise without changing the cradle assembly, the company says. The company offers a choice of four tank models with the basic trailer. Boom assemblies are available in six and eight row widths, in either aluminum or PVC rigid plastic pipe laid in and reinforced by steel angle iron. For details, check No. 6902 on the coupon and mail to this publication.

No. 6903—Film on Phosphate

"Mountain of Life" is the title of a 24-minute motion picture in full sound and color telling the story of phosphate fertilizer, that is being offered to groups throughout the west who are interested in agriculture. The film was produced by Western Phosphates, Inc., manufacturer of Anchor Brand fertilizers, and Wilson & Geo. Meyer & Co., Intermountain, Western Phosphates' sales agent. The 16-mm film describes the role of phosphate fertilizers in farming and illustrates mining and processing of phosphate. Highlights include actual fertilizer field studies. Check No. 6903 on the coupon and mail to this publication for details.

No. 6904—High Clearance Sprayer

A new model of the Blue Boy high clearance sprayer has been announced by John Blue Co., Inc. Features of the sprayer include adjustable rear tread, high safety rating in that the driver turns with the front wheel, 58 in. standard clearance with 72 in. clearance optional, positive foot control clutch, direct drive pump, low center of gravity, hinged front fenders for easy clutch and drive chain



adjustment, adjustable height boom and adaptability to dusting, spraying and defoliating, company literature said. Details can be secured by checking No. 6904 on the coupon and mailing to this publication.

Also Available

The following items have appeared in the What's New section of recent issues of CROPLIFE. They are reprinted to help keep retail dealers on the regional circulation plan informed of new industry products, literature and services.

No. 6898—Mobile Sprayer Bulletin

Mobile "Paragon" power and hand sprayers for lawn and garden use are detailed in a fully-illustrated bulletin published by the Campbell-Hausfeld Co. Featured in the bulletin are two new 15 and 30 gal. power sprayers, the company says. The bulletin illustrates both units and details construction highlights. Features of the company's hand sprayers are shown in a cutaway illustration. This section also describes operating features. Accessories and other models are also described and illustrated. Copies are available. Check No. 6898 on the coupon and mail.

Dowpon to be given away to customers. The sample contains enough herbicide to treat 225 sq. ft. in a fence line, along a driveway or around a building, the company said, and the material can be applied with usual hand equipment or even with a sprinkling can. Details can be obtained by checking No. 6896 on the coupon and mailing to this publication.

No. 6900—Weed Killer Film

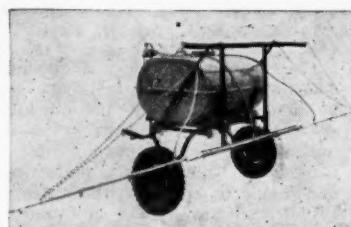
A 10 minute, one-reel movie featuring the "fate of five noxious weeds," has been released by E. I. du Pont de Nemours & Co., Inc. The film is 16 mm., full color, with sound. Field bindweed is the chief "villain" of the film, but leafy spurge, Russian knapweed, Bur ragweed and Canada thistle also play prominent roles. Du Pont's weed killer, "Trysben" 200, is also featured. The film is available for showing before agricultural groups. For more information, check No. 6900 on the coupon and mail.

No. 6901—Spreader Literature

Literature describing the Challenger lime and fertilizer spreader has been published by the manufacturer, Highway Equipment Co. The Challenger is a positive feed, self-unloading lime and fertilizer spreader which offers either a single spinner with an 18 in. conveyor or twin spinners with a 24 in. conveyor. For copies, check No. 6901 on the coupon and mail.

No. 6895—All Purpose Sprayer

A new model all purpose sprayer has been introduced by Spra-White Chemical Co. Called the "Spra-Master," the unit features a fiberglass



tank and "boom extenders." The fiberglass tanks are new with the company this year and are available in 200 gal. capacity only, the firm said. The tanks are also available separately for mounting on any trailer or trailer sprayer and can be ordered in any color when ordered as tanks alone, the company says. The Spra-Master carries a three section, 20 ft. aluminum or galvanized steel boom. Boom extender nozzle attached to the ends of the boom as standard equipment offer a continuous spray pattern approximately 10 ft. beyond each end of the boom, the company says. For details, check No. 6895 on the coupon and mail.

No. 6899—Drosophila Fly Control

"Drosophila Fly Control" is the title of a booklet recently published by Chemical Insecticide Corp. The booklet contains data compiled by the research staff of the firm, and the information is designed as a guide to effective control of the Drosophila fly. Pyrix 10, an insecticide developed by the company, is discussed at length. A section on how to control the fly under various conditions is included. A list of the firm's other products is also presented. For copies, check No. 6899 on the coupon and mail.

No. 6897—Insecticide, Fumigant Bulletin

"Useful Information for Users of Insecticides and Fumigants," is the title of a bulletin made available by

Send me information on the items marked:

- | | |
|---|---|
| <input type="checkbox"/> No. 6893—Plastic Sprayer
Nozzle | <input type="checkbox"/> No. 6899—Drosophila Fly Control |
| <input type="checkbox"/> No. 6894—Cattle Spray Brochure | <input type="checkbox"/> No. 6900—Weed Killer Film |
| <input type="checkbox"/> No. 6895—All Purpose Sprayer | <input type="checkbox"/> No. 6901—Spreader Literature |
| <input type="checkbox"/> No. 6896—Grass Control
Promotion | <input type="checkbox"/> No. 6902—Trailer Sprayer |
| <input type="checkbox"/> No. 6897—Insecticide, Fumigant
Bulletin | <input type="checkbox"/> No. 6903—Film on Phosphate |
| <input type="checkbox"/> No. 6898—Mobile Sprayer
Bulletin | <input type="checkbox"/> No. 6904—High Clearance
Sprayer |
| <input type="checkbox"/> No. 7452—Equipment Leasing
Study | |

(PLEASE PRINT OR TYPE)

NAME

COMPANY

ADDRESS

CLIP OUT—FOLD OVER ON THIS LINE—FASTEN (STAPLE, TAPE, GLUE)—MAIL

FIRST CLASS
PERMIT NO. 2
(Sec. 34.9,
P. L. & R.)
MINNEAPOLIS,
MINN.



BUSINESS REPLY ENVELOPE

No postage stamp necessary if mailed in the United States

POSTAGE WILL BE PAID BY—

Croplife

P. O. Box 67

Reader Service Dept.

Minneapolis 40, Minn.

ed by the Dow Chemical Co. The program will support the sale of Dowpon as a grass control agent, the company said. Feature of the promotion will be the offer of free trial packages of Dowpon through Dow dealers, the company said, and all dealers signing up for the program will be stocked with 2 oz. packets of

**USEFUL INFORMATION
FOR
USERS OF INSECTICIDES
AND
FUMIGANTS**



ACME PROTECTION EQUIPMENT CO.

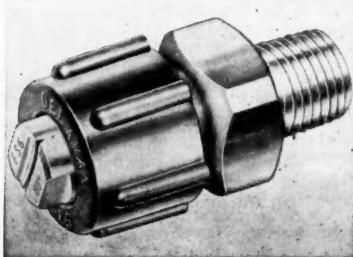
Acme Protection Co. The four-page publication briefly assembles information on the history, use, hazards and protection for users of modern insecticides. It also describes available mask equipment. Copies of Bulletin No. 591 are available upon request. Check No. 6897 on the coupon and mail to this publication.

**No. 7452—Equipment
Leasing Study**

"The Pros and Cons of Equipment Leasing for Smaller Manufacturers, Stores and Supermarkets," is the title of a study published by the Foundation for Management Research. The 16-page study discusses the cost of leasing compared with outright purchase and purchase through conditional sales contract. Complete cost charts are used to illustrate the material. Advantages and disadvantages of equipment leasing in specific business situations encountered by smaller enterprises are set out in detail. Copies are available by checking No. 7452 on the coupon and mailing to this publication.

**No. 6893—Plastic
Sprayer Nozzle**

Delavan Manufacturing Co. has introduced a nylon nozzle for use in the agricultural sprayer industry. According to the company, the basic advantage of the nozzle lies in its ability to

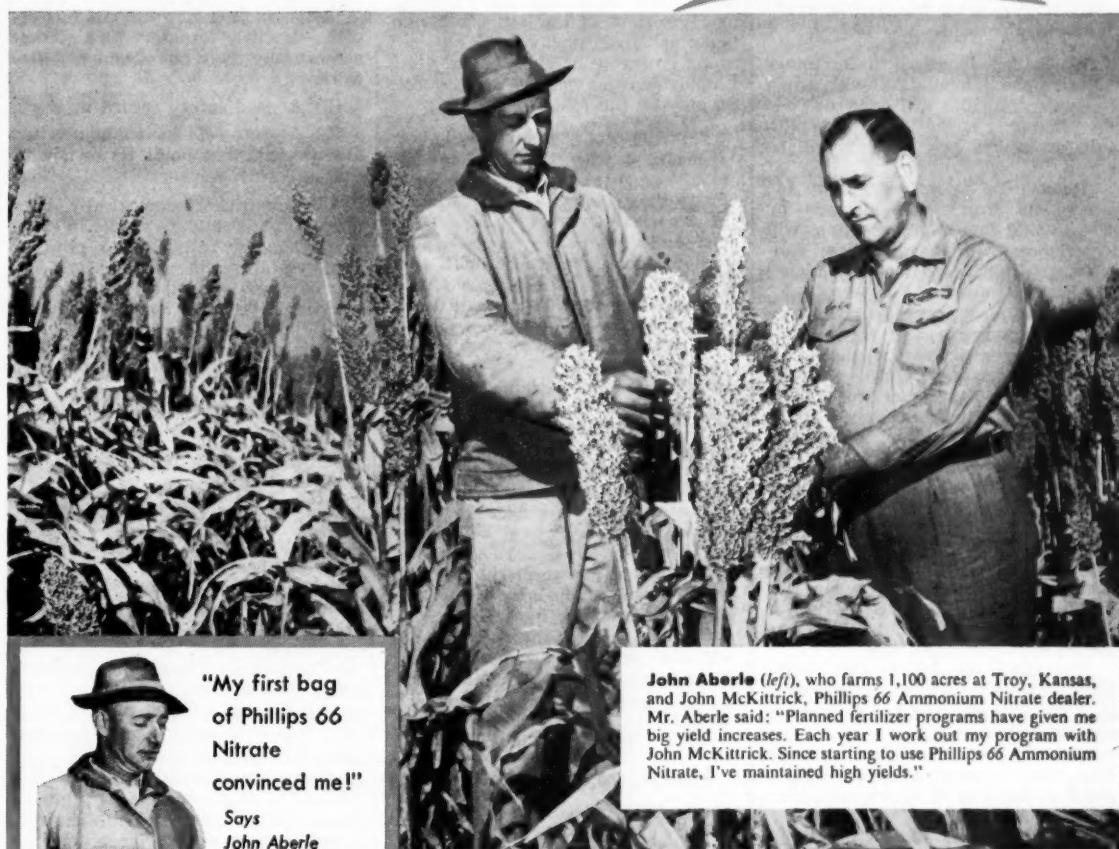


withstand the corrosive effects of agricultural chemicals, especially the liquid fertilizer solutions. The available nylon parts consist of the nozzle cap, nozzle body and nozzle strainer. The tip can be furnished in brass, aluminum or stainless steel. Complete details are available by checking No. 6893 on the coupon and mailing to this publication.

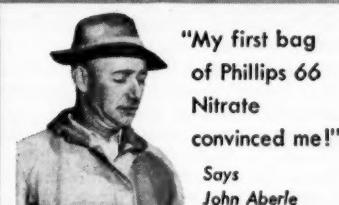
**No. 6894—Cattle
Spray Brochure**

A colorful, fold-out type brochure has been made available by Glenn Chemical Co., Inc., concerning the firm's product "Tabatrex." The illustrated publication contains information about what the product can do for dairy herds, the farmer, the dealer and the distributor. Aimed at all formulators, the brochure discusses the firm's 1959 advertising and promotion plans. Specifications and information about the product are given. Copies are available by checking No. 6894 on the coupon and mailing.

**PHILLIPS 66 ads like this appear regularly
in CAPPER'S FARMER, PROGRESSIVE FARMER, FARM JOURNAL,
FARMER-STOCKMAN and FARM and RANCH... part of a
continuing program to help dealers sell more mixed fertilizers
and PHILLIPS 66 AMMONIUM NITRATE.**



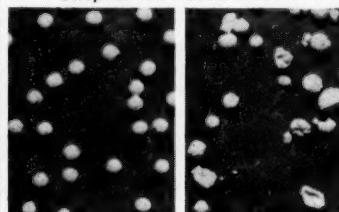
John Aberle (left), who farms 1,100 acres at Troy, Kansas, and John McKittrick, Phillips 66 Ammonium Nitrate dealer. Mr. Aberle said: "Planned fertilizer programs have given me big yield increases. Each year I work out my program with John McKittrick. Since starting to use Phillips 66 Ammonium Nitrate, I've maintained high yields."



"My first bag
of Phillips 66
Nitrate
convinced me!"
Says
John Aberle

"Believe me, I carefully examined the first bag of Phillips 66 Ammonium Nitrate that I bought. Ordinary nitrate that clogs or cakes won't do for me. That first bag contained prills that were hard, round and dry. Every bag since has been the same uniform quality, which I believe has helped me get higher average yields."

Both products shown 2 times actual size



New Phillips 66 Ammonium Nitrate Ordinary Ammonium Nitrate

Proof of the difference

In these unretouched photographs, thanks to Phillips new and different electronically-controlled process—and polyethylene-lined bags—you get round, hard, dry and uniform prills that stay that way in storage and during application. This means uniform distribution and more even feeding and higher yields. It will pay you to ask for Phillips 66 Ammonium Nitrate with 33.5% nitrogen.

**Planned fertilizer program
gives him big yield increase**

Mr. Aberle said: "After starting to plan my fertilizer programs, my corn and maize yields have increased 30%, wheat yields have doubled. My wheat program is a pre-plant application of 175 pounds of 16-20-0. Then I top dress the wheat in the spring with Phillips 66 Ammonium Nitrate. The nitrate kicks the wheat along and really makes the bushels."

"My business is farming, and I've found it good business to plan my fertilizer programs — just as I plan other phases of my farm operation."

And any of my fertilizer programs are sure to include Phillips 66 Ammonium Nitrate."

Like Mr. Aberle, other successful farmers find that the combination of Phillips 66 Ammonium Nitrate... and friendly assistance from their fertilizer dealers help them get higher yields, more profit.

See your fertilizer dealer about planning a profitable balanced fertilization program... using Phillips 66 Ammonium Nitrate and his high quality mixed grades.

"A good name  to grow by"

PHILLIPS PETROLEUM COMPANY. Sales Offices: Amarillo, Tex.—First Nat'l Bank Bldg. • Atlanta, Ga.—1428 West Peachtree Street, Station "C" • P. O. Box 7313 • Bartlesville, Okla.—Adams Bldg. • Chicago, Ill.—7 South Dearborn St. • Denver, Colo.—1375 Kearny St. • Des Moines, Iowa—6th Floor, Hubbell Bldg. • Houston, Tex.—6910 Fannin Street • Indianapolis, Ind.—3839 Meadows Drive • Kansas City, Mo.—201 E. Armour Blvd. • Minneapolis, Minn.—215 So. 11th St. • New York, N. Y.—80 Broadway • Omaha, Neb.—3212 Dodge St. • Pasadena, Calif.—317 North Lake Ave. • Raleigh, N. C.—401 Oberlin Road • Salt Lake City, Utah—68 South Main • Spokane, Wash.—521 East Sprague • St. Louis, Mo.—4251 Lindell Blvd. • Tampa, Fla.—3737 Neptune St. • Tulsa, Okla.—1708 Utica Square • Wichita, Kan.—501 KFH Building.

They Can Improve Your Profits . . .

Don't Disregard 'Little-Used' Employee Source

By HARRY DAVID

Management Methods Division
Small Business Administration

Good personnel, as any businessman knows, is one key to success and profits. This is particularly true of small business concerns.

Yet the majority of small business owners and managers neglect a rich source of employees who would be valuable assets to their firms. Who are these "forgotten workers" who face resistance, rebuffs and rejection despite their proven capabilities, good working records, and fine skills and experience?

The three groups—middle-aged and older workers, the handicapped, and members of minority groups—will be discussed separately, starting with the middle-aged and older persons.

In the decade ahead these things will happen: Population will grow; consumer demands will rise; the need for yet higher output will follow. Result: 10 million new workers will be needed.

Because the "older" age group (45 years and over) will increase by 4.9%, while the 25-44 age group will experience a relative decline. Employers will have to look to "older" employees to fill the gap.

Business men can take advantage of this change in age trends. For these older men and women, now largely "under-used," bring to their jobs first-rate experience, good backgrounds, and a more mature outlook than do their younger fellow employees.

• **Age Trouble.** This was true in the case of Henry Hudson (name disguised), a newspaper man with long, first-rate experience, who recently walked into the office of a small daily seeking a job. He was hired on the spot. But just as he was ready to report for duty, the personnel manager called him.

"I'm afraid the deal is off," he announced. "Our publisher is impulsive. He forgot to ask your age. Sorry, but you know how it is."

Henry Hudson knew exactly how it was. The company's hiring policy stood in the way of hiring men over forty. Hudson was 41.

Of course, hiring policies which put limits on the age of a worker are only one major reason for middle-age-and-older applicants' woes. Another root of the trouble is the popular conception that younger men produce better, learn faster and adjust quicker. Actually, this is not the case.

• **Productivity.** Contrary to general belief, people past 40 not only match younger men's on-the-job performances, but frequently out-distance them in productivity, quality and accuracy in identical or comparable positions. And youthful stay-with-it-ness is much over-rated: Statistics point up the fact that absenteeism is greater among the young than among their older fellow workers. Job-jumping, too, is more prevalent among the young than among "oldsters" of 40 and over. Furthermore, resourcefulness and experience lessen the need for supervision over older workers' activities.

• **Availability.** Small business can benefit also from older workers' availability. Frequently, when large firms move to different locations, only the younger, less settled employees move along. And when small businessmen look for temporary or part-time help, they may find it readily available among the top-age group left behind.

• **Pension Costs.** But are you concerned about the cost of employing "older" workers, relating to pension and insurance plans? A recent study, published by the Department of Labor's Bureau of Employment Secu-

rity, may dispel some of your worries. Entitled "Pension Costs—In Relation to the Hiring of Older Workers," the publication challenges the notion that costs of pensions for older-age groups are prohibitively higher than those for younger employees.

Pension and insurance problems need not keep you, as a small business operator, from availing yourself of the skills, knowledge and services of older employees. Employers are beginning to learn that, if benefits to workers are based upon a worker's length of service, wages earned—or both—their costs are not affected by age. More and more pension plans are being written upon this basis.

• **Employee Sources.** Well, where do you find these men who represent nearly a third of the nation's 60-million-plus labor supply—and one-half of its reservoir of skills? The State Employment Service is a good source. So may be the following groups:

(1) Non-profit organizations (concerned with the problems of middle-aged and older workers): Forty-Plus Clubs; Senior Citizens of America; Over Forty, and Golden Age Club.

You might also check with the Older Workers Committees of Community Councils, Chambers of Commerce, Mayors' Committees, councils of social agencies, civic clubs, fraternal organizations, employer associations, and labor unions. (You will find local chapters listed in your classified telephone directory, under such headings as "associations" and "organizations.")

(2) Firms having compulsory retirement plans. For leads consult employer organizations; Chambers of Commerce or Boards of Trade; labor unions, and the local office of your state employment agencies. (See classified telephone directory.)

To find retired government and military personnel for part or full time employment, contact the state employment services, fraternal organizations, and clubs concerned with the problems of older persons.

Handicapped Employees

A second category of "forgotten workers"—the handicapped employees—also represents a vast reservoir of valuable manpower: About one out of 10 working adults is a handicapped person.

• **Wide Range of Skills.** For the small businessman the significant factor here is this: These men and women have the same wide range of skills, abilities and interests as do their non-handicapped fellow citizens. Because of their physical disabilities, however, they face an uphill fight to be even considered for jobs.

At the height of the war-time manpower shortage, a young girl whom we shall identify as Miss S., walked into the office of a small company. Although the firm was looking for additional help, the manager was reluctant to hire her. His reason: Miss S. was an arthritic. She

was also persistent; and her sincerity and mental acuteness finally overcame his resistance. He agreed to give her a try.

He has never regretted his decision. Today, 15 years later, Miss S. is still with him. She is now his office manager, and he considers her one of his most reliable and trusted employees.

"I'd hate to have to get along without her," her boss confesses.

• **Performance.** Arthritis, of course, form only a segment of the vast army of persons with a wide variety of disabilities. But whatever their physical difficulties, the country's 6 million handicapped can proudly point to these accomplishments:

(1) A high rate of production, often a little greater than that achieved by their non-disabled fellow workers.

(2) A good safety record at work.

(3) A rate of job-changing and absenteeism that holds its own with that of other workers.

• **Imagination.** Axiomatically, handicaps often stimulate people to great performances, both in the physical and mental realm. Imagination and inventiveness are important assets to businesses large or small. And what small business proprietor could not use the creative urge shown by several hundred handicapped workers in a large midwestern company who submitted over 4,000 suggestions in a single year.

• **Aptitude.** It is unlikely, of course, that you will hit the jackpot every time you hire a worker, handicapped or not. But, remember that some handicapped people have a very keen sense of hearing, touch or sight, which enables them to perform jobs requiring a high degree of sensory ability not commonly found in non-handicapped persons. And they perform sedentary, routine jobs successfully.

• **Brain-Power.** There is plenty of brain-power among the handicapped as was proved by one cerebral palsy victim whose determination put him through college and earned him a degree in economics. While in college, he discovered a latent writing ability, and he is now writing (with the aid of a dictaphone) about his favorite subject—economics—for businessmen.

Of course, most small businessmen don't need economists, but they do need bright, capable, dependable workers. And the vast majority of the handicapped fit these requirements.

• **Blueprint for Employment.** But success or failure of your handicapped-employment policy will depend largely on your own attitude toward the disabled. You, like many small business owners and managers, may want to do your own employee-selecting. If so, there are two guides it might be wise to follow.

(1) Make a job inventory. Be sure

that you know each job's actual physical requirements, so that the handicapped worker's physical ability can be matched with the job's physical demands.

(2) Regard applicants solely from point of view of their ability to perform a given job. But make sure that job needs—especially the physical requirements—and applicants' capabilities match.

These two cardinal points in the hiring and employing of the handicapped are constantly kept in mind by large concerns. One giant Detroit company uses hundreds of disabled, including arthritics, cardiacs and amputees whom the company finds useful in such occupations as materials handling, machine operations, die making, cleaning, machine set up, and many clerical jobs.

Yet another large organization, which employs a great many handicapped people takes a strictly realistic attitude toward the problem of employing handicapped labor.

"We put our emphasis on abilities rather than disabilities," its manager of employment services said not too long ago. "...No special jobs are created for the handicapped. We feel that the individual is not properly placed unless he is on a regularly established job that must be done anyhow, whether by an able-bodied or a handicapped person."

The lesson: Let enlightened self-interest, not emotional impulse, be your hiring guide, too.

• **Avoid Pitfalls.** It was an impulse that led one small business manager to hire a blind woman of his acquaintance for a certain clerical job in his small company. She was unable to perform her functions properly. Her employment eventually created so much friction that the manager had to let her go.

Such human relation pitfalls can be avoided, however. If the alert small business operator applies the "right man (or woman) in the right place" rule, he will agree with a statement made recently by an official of the President's Committee on Employment of the Physically Handicapped.

"The important thing to remember," he said, "is that when properly placed, handicapped workers make outstanding employees, and perform on the job as well, if not better, than many of the non-handicapped employees in the same type of work."

• **Employee Sources.** Now, who can help you find them? Check with the following agencies and groups:

(1) State Vocational Rehabilitation Agencies. Affiliated with the Office of Vocational Rehabilitation of the U.S. Department of Health, Education and Welfare, they have offices in every state and territory. (Check your local telephone directory for the office in your town; or write to the state director, usually located in the state capitol.)

(2) State Employment Services. Any one of SES' 1,800 offices will refer qualified applicants to you. Also they will show you how to analyze your job vacancies to determine the skills, knowledge, and physical requirements needed to perform them successfully. (Check your telephone book for local address. If you can't find the address of the local office, write to the state employment security director, usually located in the state capitol.)

In addition, veterans' organizations and VA hospitals, health services and sheltered workshops, social service agencies, and Employ the Handi-

SUMMARY

All too many small business owners and managers are missing a chance to improve profits. How? By disregarding a vast, varied pool of personnel, counted in the millions. Thousands of small business operators overlook, undervalue, or ignore many valuable under-used sources of employees.

Clearly, part of this problem is popular prejudice—and misunderstanding, a phenomenon not confined to the business community. Yet the practical small business proprietor may want to take a closer look at the "forgotten workers" in his own area. They fall into three general categories:

- (1) Middle-aged and older employees;
- (2) Handicapped employees; and
- (3) Members of minority groups.

This article discusses each of these categories, and gives facts and figures that may help you in determining your future employment practices toward these under-utilized workers.

capped Committees may be useful sources of handicapped labor.

Minority-Group Employees

Good public relations help smooth the way to success. This statement does not refer to a "double-barreled, and expensive, agency-manufactured" public relations program. Few small business firms can afford such an ambitious program; nor do they need it. But they do need good public relations. And they can have it.

• Mr. Smith's Problem. But the need for the human side of public relations was brought home dramatically to one unhappy store owner, Jonas Smith, in a big eastern city just recently.

He just couldn't understand it: Recession-recovered customers flocked into neighboring stores; most of them avoided his. Why? He blamed his window display and advertising. He made changes in both. The results were disappointing.

Well, what was wrong? Oddly, it was one of the other store owners who set him on the right track.

"Smith," he said, "have you ever thought about hiring a Spanish-speaking salesman?"

• Mr. Smith Finds a Solution. Smith was dumbfounded. But soon he began to see the point: His store was located at the fringe of the city's Puerto Rican section. Smith hired a young Puerto Rican—and his business began to pick up.

Smith's experience can serve as a beacon for other small business operators, who can profit from the special skills and diversified backgrounds of minority group workers.

• Bright Spots for Minorities. Some businesses are doing just that. A southern company, for instance, made an agreement with an agricultural and industrial state university in the South, an all-Negro institution, whereby the school participates in the company's vocational training program. And the company has hired some of the students who enrolled in its training courses.

A northern company is among those that include Negro colleges as recruitment sources.

Another concern successfully uses the method of hiring Negro employees through the facilities of the Urban League, which screens applicants carefully before referring them to the employer. And a Chicago firm recruits Negro youngsters in the public schools for trainee positions leading to clerical jobs. These examples, of course, could be multiplied.

• Employee Sources. Some of the organizations which will help you find such "forgotten workers" are:

(1) National Urban League. The league's main office is at 14 E. 48th Street, New York, N.Y. It may have a branch in or near your town. The league offers industrial relations counseling service to employers to increase employment opportunities for Negro workers.

(2) B'nai B'rith. A Jewish service organization offering vocational service work. (Contact your local office, or write B'nai B'rith headquarters at 212 Fifth Ave., New York City.)

(3) National Catholic Welfare Conference—Social Action Department. The department provides community service for various social and employment problems. (The organization's headquarters are located at 1312 Massachusetts Ave., N.W., Washington, D.C.)

(4) Commonwealth of Puerto Rico (Department of Labor—Migration Division. Established by the Puerto Rican government to assist Puerto Ricans in obtaining employment. (Write to: 322 W. 45th St., New York 36, N.Y.)

Other agencies: Japanese American Citizens League; American Friends Service Committee; colleges and universities; placement or employment bureau; Negro colleges, and state employment agencies.

In this connection, the President's Committee on Government Contracts,

which supervises the equal-job-opportunity program for firms with government contracts, suggests "private and public employment services, technical and business schools, and high schools" as sources for under-used personnel.

Of course, this article can present only a few of the facts and figures—and the meaning behind them—concerning the three groups of "Forgotten workers." If you want to read further on the subject of older workers, you might obtain Management Aids for Small Manufacturers, No. 81, available free from the Small Business Administration, Washington 25, D.C., and you can get additional information on this subject and the other two groups from some of the organizations mentioned in this article.

DEALERS TOUR PLANT

WATERLOO, IOWA—An estimated 200 feed and fertilizer dealers from Iowa, northern Illinois and southern Minnesota were guests of the Rath Packing Co. here recently for an inspection of the new equipment at the Rath feed and fertilizer plant. The visitors were also taken on a tour of the packing plant.



FRONT VIEW of the Mitchell Seed & Grain Co., Roswell, N.M. Owner Ervin Mitchell's flair for advertising can be seen in the signs, which he personally designed. Feed trucks are loaded from a dock on the right side of the building.

ADVERTISING

(Continued from page 9)

It is different and attracts attention."

Though the news letter has been discontinued, the store still sends out testimonial letters concerning the firm's products. Mr. Mitchell says not everyone will believe them all, but they will talk about the products and ask about them the next visit to the store.

The store's main sales come from feeds, but it also does a good business in fertilizers and other farm chemicals, field and garden seeds, poultry supplies, bulbs and general farm and ranch supplies. In his advertising, Mr. Mitchell calls it the store of one million items.

One thing seldom found in stores of this area is that he mixes all types of insecticidal dusts and chemicals. This is stressed heavily during the proper season, with many sales being made after his radio announcements.

During one program he announced a shipment of Malathion in 8-oz. bottles and before nightfall had sold three dozen.

Sometimes on his program he mentions some controversial subject related to agriculture. Within minutes he will be getting telephone calls about it. Once he called a breed of cattle by the wrong name, and by 11:00 a.m., six or seven ranchers had dropped by the store to correct him.

"Don't be afraid of making a mis-

Alfalfa Fertilizer Test To Begin in Colorado

MOSCA, COLO.—Work is scheduled to begin this spring at the Mosca-Hooper experimental plots on a new phosphate fertilizer experiment with alfalfa.

William T. Franklin, Colorado State University experiment station agronomist and project director, said the objective will be to note how rates, replacements and sources of phosphate fertilizer affect alfalfa yields. Land which was planted with tall wheatgrass will be used. If possible, the experimental site will be chiseled to a depth of 2 ft. or more before plowing out the wheatgrass.

Rates of phosphate to be tried will be 50 and 200 lb. an acre with either treble superphosphate or dicalcium phosphate as the carrier. Fertilizer will be applied by plowing down, drilling and broadcasting. The plots will receive adequate surface irrigation in order to establish a good alfalfa stand.

Besides Mr. Franklin, other researchers who will participate in the experiment are agronomists Willard R. Schmehl and S. D. Romsdal. The work will run about four years.

Trade Winds

From California

EXETER, CAL.—The Steeds, a new farm and garden supply store, has been opened on Ave. 310 and Road 216, Exeter, by Lewis F. and Edna D. Steed.

FRESNO, CAL.—John R. Angelich has loaned the first part of his last name to the newly-formed Anco Industrial Co., a new weed control firm at 1484 Fay Ave., Fresno.

WATSONVILLE, CAL.—The Lesco Seed and Chemical Co. has been incorporated in Watsonville to market seeds and agricultural chemical products. Capitalization has been set at \$100,000. Heading the new concern are Lewis W. Lettunich, Jr., George Saulovich, and James L. MacLellan, all of Watsonville.

SANTA CLARA, CAL.—A new garden and nursery supply store is expected to be opened soon by Sam R. Abinante at Stevens Creek Blvd. and Cronin Drive, Santa Clara.

MOUNTAIN VIEW, CAL.—The Nikko Nursery is the name of a new farm and garden retail operation opened by Frank E. Oikawa at 1030 Grant Rd. in Mountain View. Farm chemicals are featured in special displays in the new store.

FREMONT, CAL.—A new garden and farm supply store has been opened by George L. and Eleanor Carroll under the name of Carroll's at 514 South Broadway, in Fremont. The area, a center of new home developments adjoining rural communities, is a trading section for users of chemicals both for home gardens and farms.

RICHMOND, CAL.—The Ninoyima Nursery Corp. has been founded in Richmond with a capitalization of \$200,000. Owners of the firm include Tamaki Ninoyima and several associates.

Important Message about GRANULAR HERBICIDES

Diamond granular* 2,4-D herbicides are manufactured in two forms and sold under our CROP RIDER label:

- For application in farm ponds, lakes, irrigation ditches and drainage ditches.
- For ground application, using any satisfactory type of spreaders . . . an ideal method, since it avoids risk of spray drift.

Newer developments have shown that granular applications of 2,4-D and other hormone-like herbicides have considerable promise for weed control. We would like to discuss these with you. DIAMOND ALKALI COMPANY, 300 Union Commerce Building, Cleveland 14, Ohio.

*Manufactured under U.S. Patent 2,702,295

Diamond Chemicals



FARM SERVICE DATA

Extension Station Reports

The potato plant itself may call the tune on fertilization with potash and other plant nutrients as the result of a three-year research project under way at the University of California, Berkeley.

Success in the experiments would provide potato growers with a system of plant analysis for diagnosing a shortage of potash—known to be one of the factors in the internal black spot problem that's troubling growers in California and elsewhere.

With a plant analysis system, the plant itself could be used as a gauge for applying correct amounts of potash and other chemical fertilizers on potato croplands.

Aided by a yearly grant of \$3,000 from the American Potash Institute, the research will be conducted on the Berkeley campus by Albert Ulrich, plant physiologist who previously developed a successful plant analysis system for sugar beets and is currently engaged in a similar project with beans.

"We plan to make a thorough study of the potato plant growing under controlled conditions," Mr. Ulrich says.

"By varying the amounts of chemicals in nutrient solutions and comparing deficient with well-supplied plants, we hope to determine accurately the effects of potash deficiency, acidity and other factors on the occurrence of internal black spot."

The full program of plant analysis, already in use on sugar beets, includes the collection of certain leaf and stem parts by the grower, analysis of these tissues in a commercial laboratory and interpretation of the results to show which nutrients the plants are lacking.

The potato nutrition research, besides supplying information for growers and other crop specialists, is planned to provide training and support for a graduate student studying in the field of plant nutrition.

The project at Berkeley is part of a large-scale research effort on the black spot problem now under way

on three campuses of the University and in numerous field locations.

University scientists are looking into climatic influences, soil differences, irrigation practices, handling methods, plant diseases, and other factors in an effort to discover the exact causes and prescribe effective cures for the quality-reducing problem.

★

"Fertilizer and water work together as a team, and offer promise of tremendous increases in crop production."

That's a statement made by Dr. Richard B. Bahme, western regional director of the National Plant Food Institute, San Francisco, speaking at the California Irrigation Conference held on the University of California campus at Davis recently.

Dr. Bahme cited seed cotton in Kern County, California in 1957 as an example, to show the impressive results of fertilization with proper irrigation.

"With very limited irrigation and no fertilization, 2,300 lb. of seed cotton an acre were produced; when 100 lb. of nitrogen an acre were applied, production increased to 2,411 lb. an acre; but with frequent irrigation and with 100 lb. of nitrogen, 2,788 lb. of cotton an acre were realized," he said. "This is a total increase of 488 lb. an acre.

"However, either too little or too much water for a particular crop will lower the efficiency of the fertilizer used," Dr. Bahme warned. "Irrigation and fertilization are close partners and must be jointly considered in any crop production program."

NPFI is currently supporting research at the University of California to bring to light new facts on the interaction of fertility and soil moisture. Dr. Bahme recently presented, on behalf of NPFI, \$3,000 fellowship to Ben Zur, graduate student in the department of irrigation, to carry on such a study at Davis.

Irrigation practices for special

crops, results of the lack of sufficient moisture, current developments in water policy, and various aspects of irrigation equipment were among other topics discussed at the conference.

The California Irrigation Conference, attended by farm advisors, university personnel, and representatives of the irrigation equipment industry, growers associations, and federal and state agencies, was sponsored by the California Irrigation Assn. in cooperation with the California agricultural extension service, department of irrigation.

★

Corn production is increasing so rapidly in the Pacific Northwest that in 1959 Oregon, Washington, and Idaho farmers may raise as much corn as has been used each year in these states, believes Marion D. Thomas, Oregon State College extension agricultural economist.

This might seem quite an about-face for Oregon, long considered a corn-importing state. Until recently, Oregon shipped in more than 2 million bu. of corn a year, mostly from the Midwest.

The state's total corn production last year topped the 3 million bu. mark for the first time, nearly triple the amount five years earlier. Early planting plans indicate a 30% increase in acreage for 1959.

About two-thirds of last year's total production was for grain, the rest for silage and green feed. Oregon farmers are finding they can get 25 to 30 tons of corn silage an acre, reports Rex Warren, extension farm crops specialist at OSC. He added that corn silage is being used more and more as a feed for beef as well as dairy cattle.

In its early days, Oregon's prospect of becoming a corn-raising state appeared dim. Attempts of pioneers to grow corn proved quite unsatisfactory. Varieties settlers brought with them were not suited to Oregon's cool summers and low rainfall during the growing season. A survey in 1908 found most farmers agreeing that corn could not be grown profitably in the state.

Last year, just 50 years later, an Oregon entry of 163.9 bu. an acre ranked above entries from all other states in a nationwide corn seed company yield contest. And top yield in the 1958 State Corn Show was 182.9 bu. an acre.

Dr. D. D. Hill, head of the farm crops department at the college, says it's true that Oregon conditions aren't quite as good as they should be for corn. Growing corn in Oregon requires more managerial ability than it does in the Midwest's Corn Belt. Various factors are now helping over-

BEST IN THE WEST

SALEM, ORE.—It should come as no surprise to Oregonians but guests within the state this year may be interested to learn how Oregon ranks among the "top 10" in U.S. agricultural production, especially since the state accounts for more than 36 agricultural high points. The figures here are on 1958 production. Among her 11 "firsts," Oregon tops all 48, 49, or 50 states, in these fields: filberts, 6,800 tons; cherries (sweet), 25,000 tons; snap beans for processing, 88,000 tons; mint for oil, 978,000 pounds; and eight firsts in seed crops, the state department of agriculture reports. Included in seed crops: Austrian winter peas, 17,000 harvested acres; common vetch, 14,000; common ryegrass, 72,000; perennial ryegrass, 36,000; chewing fescue, 21,000; red fescue, 7,500; bentgrass, 24,000; Marlin bluegrass, 5,500 acres.

come this situation and point to a continued increase in Oregon's corn production at least for the next few years.

However, once the Pacific Northwest becomes self-sufficient, corn production probably will level off, for it won't be profitable for farmers to continue increasing production at the rate they have been, Mr. Thomas explained.

The number of acres planted to corn in Oregon—47,000 in 1958—has more than doubled in the past five years. Average yields have jumped from 55 to 70 bu. an acre during this time.

Reasons for the recent increase in acreage devoted to corn and the high yields obtained throughout Oregon include some of the following: development of varieties suited to growing conditions, production of efficient labor-saving mechanical equipment, new weed controls, increased knowledge and use of fertilizers, and availability of land formerly used for crops no longer profitable.

A desire to overcome freight costs of shipping corn into the state also might be a factor in increased corn production locally.

Two Dusters Die

SACRAMENTO—Two northern California crop dusting pilots were killed in separate accidents April 18.

Jack Trickel, 40, of Arbuckle, was killed instantly when his plane crashed on a ranch where he was to perform rice seeding operations.

Nathaniel Jennings, 30, of Brisbane, was killed on the Schohr Ranch near Gridley when his fertilizer-loaded plane exploded in mid-air and crashed in flames into a corn field.

SHOP TALK

OVER THE COUNTER

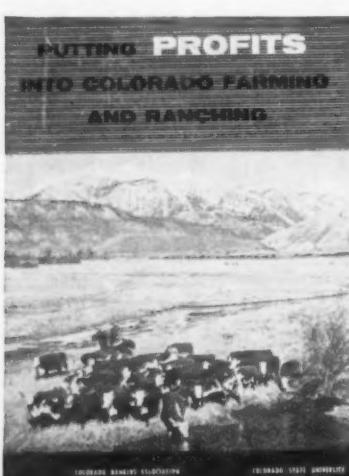
By Emmet J. Hoffman
CropLife Marketing Editor

Broadly speaking, customer complaints can be divided into eight basic groups. They are as follows: (1) Faulty products which fail to do the job claimed they will do. (2) Deficiency in quality and failure to adjust payment satisfactorily. (3) Delayed delivery. (4) Wrong products. (5) Damaged products. (6) Office errors in billing charge accounts. (7) Resentment of credit-collection methods. (8) Dissatisfaction with sales people.

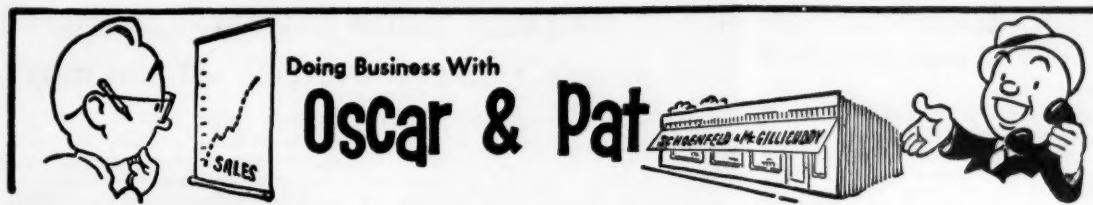
A legitimate complaint can usually be handled satisfactorily if the store's personnel has the proper attitude. If store personnel resents complaints, instead of accepting them gracefully, the customer is bound to recognize it. Results are usually bad when a complaint is accepted resentfully.

Assuming that most every complaint is justified, sales personnel should be glad to handle it, listen while the customer has his complete say and then handle it as cordially

as possible. Only then can the customer be expected to leave the store, satisfied that his complaint was justly handled, and become a booster of the store by telling friends how cooperative the salesman was in making an adjustment.



TWO BOOKLETS have been prepared and published by the National Plant Food Institute in cooperation with western organizations. "Putting Profits into Colorado Farming and Ranching" is the title of a 20 page, illustrated booklet which NPFI put together with the help of the Colorado Bankers Assn. and Colorado State University. It contains information about fertilizer economics and is designed to "show how and why the wise use of commercial fertilizer in conjunction with other practices can increase farm profits." The other booklet, also 20 pages and illustrated, is called "More Profits from Fertile Soils in California." It was prepared with the help of the California Fertilizer Assn. and the University of California. The booklet emphasizes that "scientific farming is a must" for the modern farmer. The NPFI's Western division address is 550 Kearny St., San Francisco 8.



By AL P. NELSON
CropLife Special Writer

Plump Tillie Mason, the ulcerish bookkeeper, had her arms full of magazines, letters and one sizeable package as she came into the office that early May morning.

"Gosh," she wheezed putting down the mail on her desk and rubbing circulation into one arm, "there sure was a lot this morning."

Oscar Schoenfeld, his cold face impassive, came over and rifled through the mail. He always looked for the thin envelopes, those that contained checks. This morning there was not a single thin envelope. Oscar frowned.

"Ach, what is this big package with the dirt breaking out one corner?"

"Oh, it's a soil sample some farmer sent in," Tillie said worriedly. "There's a letter stuck inside. The postmaster saw the letter through the break in the package and made me pay 47¢ first class postage on the bundle."

"Forty seven cents!" frugal Oscar cried. "You should not have taken it. Let them send it back to that farmer—that stinker."

Tillie looked worried. "Oh, I suppose I should have," she said, "but I was in such a hurry, I paid the forty seven cents out of my own money. I thought if a customer sent the soil sample—"

"Ach, du Lieber!" cried Oscar. "The sample is from Mike Harrigan on Rt. 3. He owes us over \$125 from last fall already yet. I have sent lots of statements, and even Pat can't collect from him. And then he sends us a soil sample with postage due. Himmel, that shows how crazy Pat is when he advertises we will have soil tests made free for farmers. Only the bad pay ones come in with that schtuff."

"Oh, some of our good customers have come in with soil samples," Tillie protested. "Jim Gillette was in the other day, and he placed an order for fertilizer."

"Ach, and I notice Gillette didn't pay yet. He'll wait like all the rest."

"But this is the first sample that came in by mail," Tillie said. "And forty seven cents isn't much to spend on a customer."

"It's too much to spend on a customer like Harrigan!" Oscar thundered. "He's another Irisher, and he's so lazy that he can't bring in the sample—he sends it by mail, with postage due. He knows if he comes here I ask him to pay that old bill. He's afraid of me, he is."

As though to add salt to this business wound, four farmers came in with soil samples the next hour, and none of them placed an order for fertilizer or anything else. They just wanted the free soil test.

"It's about time you fellows started to give something away free around here, Oscar," joshed Pete Hawkins, one of the farmers. "You've been gettin' rich off us farmers long enough."

"Yeah," chimed in Ken Bolter, another farmer who had brought in a soil sample, "where's the free coffee? How can you fellows expect to get customers if you don't give free coffee?"

Oscar swung around in his swivel chair, his face white. "We sell schtuff here!" he said sharply. "We are not interested in giving schtuff away. You fellows should sit where I sit. You should see all the unpaid bills I have. Then you would see why we can't give schtuff away free and stay in business. Some farmers is the worst pay I ever see. Sometimes I get

so sick aboudt it, I am fed up to here." And Oscar made a quick pass across his throat.

Pete Hawkins' face got a little red. "Don't look at me, when you talk like that, Oscar," growled the man. "My 30 days ain't up yet. I don't owe you any overdue money. I know I've been a little slow some months, but right now I'm caught up. Gee, if you feel that way about my business—"

The door opened and tall, blue eyed Pat McGillicuddy came in.

"Say, I'll treat you to coffee over at the Slide Inn Cafe, boys," he smiled, showing gleaming white teeth. "Don't mind Oscar. His liver is actin' up this mornin' maybe. I ate too many green apples, too, once, and wow! What an experience!"

The two farmers, charmed a little by Pat's manner, walked ahead of

him out the doorway into the warehouse.

Oscar slammed his fist down on the desk. "There is nothing wrong with my liver!" he cried. "How can that Irisher say that? And I didn't eat any green apples. Ach—" he put his hand to his right side. "Now my liver is jumpin' a little. If that crazy Pat keeps up my liver will jump right out. Ach, why did I ever get into this business?"

Pat McGillicuddy was going to say something, but didn't. Instead she took the broken package containing Harrigan's soil sample and carefully placed it on an adjacent table. Slowly she pulled out the letter which had caused all the trouble.

Then slit open the envelope and unfolded the letter. As she read it, her eyes opened wide. Glancing at Oscar's back, she took the letter to him and laid it on his desk. Quite quickly she departed and went into the warehouse.

Oscar picked up the envelope and letter and read the missive.

Harrigan had written, "You fellows are pretty decent to offer to test soil free. You sent me some pretty nasty collection letters, but so long as you'll test my soil, I'll forgive you. Here's my check for \$125 to cover that account you've been houndin' me about. You can cash it. It's good. It won't bounce like the last one did."

TEST PLOTS

(Continued from page 9)

day basis throughout the store.

"We learned the value of cash the hard way," Mr. Breed laughs. Then he relates an experience some years ago when the company first got into the fertilizer business. It sold fertilizer to a rice farmer, who had done no previous business with the company, on a 30-day basis. The order was a big one, and Mr. Breed hoped it would pave the way for more rice business at a legitimate profit. But at the end of the 30 days, no payment was forthcoming; nor at the end of 60. In fact, the new customer never did pay for his fertilizer. And the loss involved in that one big account wiped out completely the company's fertilizer profit for the entire year.

Books on Fertilizers And Their Use

FUNDAMENTALS OF SOIL SCIENCE—Third Edition

By C. E. Millar, late Professor Emeritus of Soil Science; L. M. Turk, director; and H. D. Foth, associate professor of soil science, Michigan State University.

This text completely revises and brings up to date the second edition. Special attention is given to progress made in the basic principles of soil science since the publication of its predecessor. This edition includes more emphasis on soil texture and the concept of the texture profile, more discussion of the influence of the soil forming factors on soil development, and more facts about clay minerals to provide a clearer understanding of the differences in the behavior of soils. 496 pages, illustrated. \$2.95

SOIL FERTILITY AND FERTILIZERS (1956)

Samuel L. Tisdale and Werner L. Nelson

An advanced college text, for juniors and seniors, following background course in soils. Covers elements required in plant nutrition, their role in plant growth, and the soil reactions to these nutrients. Several chapters on manufacture, properties and agronomic value of fertilizers and fertilizer materials. Latter part covers soil fertility evaluation and use of fertilizers in sound management. 430 pages, cloth bound. \$7.75

PLANT REGULATORS IN AGRICULTURE

Dr. Harold B. Tukey

Published September, 1954. A text book giving background material for county agents, farmers, citrus growers, nurserymen, gardeners; providing fundamentals and general principles; covers encouragement of roots by plant regulators, control of flowering and fruit setting, parthenocarpy, abscission, prevention of pre-harvest fruit drop, dormancy and ripening, inhibition of sprouting and weed control. Brings together specialized knowledge of 17 authorities in the field, with two chapters written by Dr. Tukey, head of department of horticulture at Michigan State College. 269 pages. \$6.50

THE CARE AND FEEDING OF GARDEN PLANTS

Published jointly by the American Society for Horticultural Science and the National Plant Food Institute.

An entirely new, one-of-a-kind book, it is designed to acquaint readers with nutritional deficiency symptoms or "hunger signs" of common yard and garden plants including lawn grasses, shrubs, flowers, garden vegetables, and cane and tree fruits. It stresses plant "feeding," or "what makes plants grow." Sixteen of the nation's leading horticultural authorities collaborated in its preparation. Cloth bound, 300 pages of text and illustrations including 37 pages in full color. \$3.00

AUXINS AND PLANT GROWTH

A. Carl Leopold

A 368-page book, complete with bibliography, appendix, and index, discusses the fundamental and applied aspects of growth hormone and synthetic auxin action in plants. These are of interest to all workers in agricultural chemicals—for weed control, flowering controls, fruit set, flower or fruit drop and plant propagation. The text is divided into two sections: (1) fundamentals of auxin action, and (2) auxins in agriculture. These cover developmental effects of auxins, the physiological and anatomical effects of their application. The chemical nature of growth regulators, and methods of applying auxins and their persistence in plants and soils. Other subjects covered: rooting, parthenocarpy, flower and fruit thinning, control of pre-harvest fruit drop, flowering, dormancy and storage, herbicides, miscellaneous uses of auxins, and potentials of auxins and auxin research. \$5.00

Published by University of California Press.

ECONOMIC AND TECHNICAL ANALYSIS OF FERTILIZER INNOVATIONS AND RESOURCE USE

By E. L. Baum, Earl Heady, John Pesek and Clifford Hildreth.

This book is the outgrowth of seminar sessions sponsored by TVA in 1956. Part I—Physical and Economic Aspects of Water Solubility in Fertilizers. Part II—Examination of Liquid Fertilizers and Related Marketing Problem. Part III—Methodological Procedures in the Study of Agronomic and Economic Efficiency in Rate of Application, Nutrient Ratios and Farm Use of Fertilizers. Part IV—Farm Planning Procedures for Optimum Resource Use. Part V—Agricultural Policy Implications of Technological Change. It presents new methodological techniques for more efficient handling of research problems related to fertilizers and provides more meaningful answers to problems of practical application. \$4.50

HUNGER SIGNS IN CROPS—Second Edition

A symposium—published jointly by the American Society of Agronomy and the National Plant Food Institute.

A comprehensive study of nutrient-deficiency symptoms in crops compiled by 19 of the leading authorities in the field. It is being widely used by college professors, research and extension specialists, industrial chemists and agronomists, county agents and teachers of vocational agriculture. Many farmers have found it of particular value in planning their fertilizer programs. Cloth bound, 390 pages, 242 illustrations, including 124 in full color. \$4.50

USING COMMERCIAL FERTILIZER (1952)

Malcolm H. McVickar

Dr. McVickar is chief agronomist of the National Fertilizer Assn. The book deals specifically with commercial fertilizer, how it is produced and how to use it. It is non-technical. It includes chapters on how to measure fertility of soils, secondary and trade-element plant foods. 208 pages, 106 illustrations, cloth bound. \$3.50

COMMERCIAL FERTILIZERS, Their Sources and Use—Fifth Edition (1955)

Gilbert H. Collings

Based upon the author's practical experience as an experiment station agronomist and teacher, and incorporating information on recent developments by agronomists, chemists, engineers and fertilizer manufacturers. Authoritative on problems concerning commercial fertilizers and their use in gaining larger yields. 160 illustrations, 522 pages. \$8.50

APPROVED PRACTICES IN PASTURE MANAGEMENT (1956)

M. H. McVickar, Ph.D.

Outlines clearly and concisely how to have productive pastures to furnish high-quality forage for livestock, economically and efficiently. Written for grassland farmers. Covers the important activities associated with establishment, management and efficient use of pastures as grazing lands or as a source of fine winter feed for livestock. It is as specific as possible for all U.S. pasture areas. Twenty chapters, 256 pages, illustrated. \$3.00

MANURES AND FERTILIZERS

A survey by the Ministry of Agriculture and Fisheries, dealing with soil analysis, inorganic fertilizers, waste organic substances and principles of manuring. In language to give the farmer basic principles of increasing soil fertility by the application of natural organic manures and synthetic inorganic fertilizers. Many important tables on quantitative data. \$2.50

Order From Croplife

Reader Service Department

P.O. Box 67

Minneapolis 40, Minn.

(Enclose remittance)

WEED OF THE WEEK

Mr. Dealer—Cut out this page for your bulletin board



Common Mullein

(*Verbascum thapsus*)

How to Identify

Mullein is a biennial plant, reproducing only by seed. It is usually found in dry pastures, meadows, neglected fields and in waste places. In its first year, the plant produces a large taproot, a large number of lateral roots and a rosette of large, hairy leaves. During its second year, the plant sends up its characteristic coarse, rough, hairy flower stalk which ranges from 4 to 8 ft. tall. Most of the leaves are confined to the lower portion of the stalk, and all leaves are covered with long branching hairs. Flowers and seed pods are produced on terminal spikes. Each seed pod contains many tiny, brown, pitted seeds. Other common names, used in various parts of the country, include velvet dock, Jacob's staff, flannel leaf, flatwort, big taper and candlewick.

Characteristics of Mullein

This plant is not particularly harmful, except that it is prolific and robs soil of

moisture and nutrients needed for more valuable crops. The plant is a native of Europe, but is widely distributed throughout the U.S. Though found in pastures, it has no value as forage. It is mildly irritating to animals, poisonous only if taken in large quantities. It flowers from July to October in some areas. The plant does not persist in cultivated fields.

Control of Mullein

Specific chemical control is described as "difficult" by various authorities because of wide scattering. However, some herbicides will kill the plant. Most recommendations from states where the weed appears say that cutting the plant before seeds form will control it. One authority says "hoeing or spudding out the rosettes below the crown will avoid the necessity of later attention." Because of new plants from seed in the soil, mowing or cutting may be required for two or three years for complete eradication.

Arkansas Farmers Launch Spraying Programs for Pasture Weed Control

LITTLE ROCK, ARK.—The Arkansas Agricultural Extension Service reported last week that Arkansas pasture farmers have launched a concentrated drive against obnoxious weeds with the use of chemical sprays.

An Extension Service official said farmers in all sections of the state are mobilizing their resources for "an all-out battle" to rid their pastures of pesky plants that have been cutting into livestock and dairy profits.

The official said a survey shows that the sales of 2,4-D amine are already up more than one third from last year. He said increased interest in the program is demonstrated by the fact that farmers are now purchasing the chemical in 55-gal. drums, whereas they previously bought it mostly in 5-gal. quantities.

A prolonged educational program by agricultural workers is credited with starting the weed control program. Like most agricultural projects, it has taken Arkansas pasture operators several years to get on to the program.

"Farmers had to have actual proof that it would work before they laid their money on the line," one official said.

Many farmers started making plans to control the weeds on their farms after attending one of the 174 demonstrations staged last year by county agents during chemical weed control of pastures field days. Workers said many farmers left these demonstrations convinced that a similar program would pay dividends.

Harry Wellhausen, extension agronomist here, believes chemical control of weeds is cheaper and more effective than mowing. He says \$1 spent on chemical weed control brings in an extra \$4 to \$7 for the state's livestock producers.

Extension officials say increased interest in the program is due to numerous permanent demonstration plots.

In the spring of 1958, 40 small

Farm Bureau Head Scoffs at Alarm Over Chemical Use

MEMPHIS — The president of the American Farm Bureau Federation told a Memphis Farm Bureau leaders' meeting last week that alarm over the use of chemicals in farming is not well founded. However, Charles Shuman said that indiscriminate spraying of residential areas and farms alike strictly in the interest of agriculture may not be justifiable.

"Most tolerances in the use of insecticides established by the Food and Drug people are overly ample," Mr. Shuman said. "After they have been in use for a while, Food and Drug usually increases the allowance."

"I just don't put much stock in what folks say about insufficient research. If there were any really serious effects from use of either insecticides or chemical fertilizers, they would have shown up by now. After all, the U.S. and Canada are the only nations that have any restrictions at all."

"There is no evidence that the increased use of chemical fertilizers has affected health—in fact, people are getting healthier. Even so, I get letters every day from opponents of chemical fertilizers."

AMMONIA LINE BREAKS

HANFORD, CAL.—Residents in a five block area were evacuated from their homes when a hose burst while transferring liquid ammonia from a tank truck to storage tanks in the yard of California Spray-Chemical Corp.'s ammonia plant here. No injuries were reported.

2,4-D weed control plots were established—35 in Columbia County alone—to demonstrate the control of bitterweed, poor pie, ragweed, goatweed and dock. The plots were located so farmers could follow their progress throughout the summer. Excellent results were obtained from the demonstrations.

Weed Control Means Money in Bank for Arkansas Dairyman

CONWAY, ARK.—A chemical weed control program has meant extra money in the bank for a Faulkner County dairyman.

Jack Thrasher, operator of a Grade A dairy five miles east of Conway, says he has increased his profits "considerably" and the carrying capacity of his pasture by 20% since he started controlling weeds with 2,4-D spray.

Mr. Thrasher has facts and figures to back up his claims. He says bitterweeds alone cost him \$500 in the early spring of 1957 when he had 147 cans of milk rejected because it was "off flavor."

"I let the pasture go that year," Mr. Thrasher said, "but after the same thing started happening in 1958, I went to work."

"In the early spring of 1958, the pastures were so full of bitterweeds that a cow couldn't take a mouth of grass without getting some. Then I started spraying the pastures, and I didn't lose a single can of milk because of a weed flavoring."

Another Faulkner County dairyman had a similar experience. F. W. Langley, operator of a dairy five miles north of Greenbrier, says he lost enough milk before he started a chemical spraying program to "buy three or four spray rigs."

Mr. Langley, noting that the cost of sections and guards for his mowing machine would go a long way toward paying the cost of a sprayer, believes spraying rig should be standard equipment on any livestock farm.

Kentucky Firm

WINCHESTER, KY.—Kentucky Fertilizer Works, Inc., has been registered as a new firm to deal in fertilizers. J. B. McConaughey is listed as incorporator.

BILL

(Continued from page 1)

mit an orderly transition period for both the government and the industry, and to allow industry an opportunity to collect any additional data or make any labeling changes required by the legislation, provision is made whereby certain sections of these two Acts would not be applicable to some of these products until March 5, 1960 or such later date or dates, not beyond March 5, 1951.

The Secretary of Agriculture, and the Secretary of Health, Education, and Welfare may postpone the date on the basis of a determination that such is necessary to avoid hardships and will not be unduly detrimental to the public interest. These dates have been specified so as to have the fully effective dates under this bill coincide with those under the Food Additives Amendment to the Federal Food, Drug, and Cosmetic Act (P.L. 85-929). Since some products which would be affected by this bill are also subject to the Food Additives Amendment, it has appeared desirable that the two become fully effective at the same time.

Thompson-Hayward Plant Badly Damaged by Fire

KANSAS CITY, KANSAS—Three men were killed and five injured April 23 when an explosion in the mixing tanks at Thompson-Hayward Chemical Co. here destroyed much of the plant.

Robert F. Thompson, president of the company, said damage would amount to nearly \$1 million.

The block-long, one-story building was leveled when a major explosion occurred in a tank containing 3,000 gal. of weed killer, followed by several other smaller blasts. In all, eight tanks were destroyed.

The fire and explosion occurred just before 7 a.m. which is credited for reducing the number of injuries. A few minutes later, some 25 persons would have been in the immediate area of the blast.

At press time, no official announcement had been made by company of-

ficials as to the cause of the disaster. Early statements indicated that the explosion may have originated in a boiler or in a mixing tank.

The dead, all of Kansas City, were Otis J. Young, 24; Walter Evans, 25, and Jim Lewis, 26.

Dealership Sold

PULLMAN, WASH.—The Klemgard Certified Brea Brand dealership for liquid fertilizer in Whitman County, Wash., has been sold to Ben Christianson of Moro, Ore.

The former owners, Gordon Klemgard and Ed Dumas, will continue to operate the Klemgard Pea Processing Co.

Mr. Christianson, who officially took over the business April 6th, has formed the Christianson Aqua Service, Inc., to operate his new business. The new owner has farmed at Moro for about eight years and was also the manager of the First National Bank of Portland branch at Moro.



**MURIATE
OF POTASH
for the
PLANT FOOD INDUSTRY**

THIS symbol stands for high-grade uniform, coarse and granular Muriate of Potash (60% K₂O minimum). Southwest Potash Corporation provides a dependable supply of HIGH-K* Muriate for the plant food industry.

*Trade Mark

**Southwest Potash
Corporation**

INTEGRATION

(Continued from page 7)

This does not necessarily mean the growth of corporate farms. This may be accomplished in a number of ways. We shall see the growth of family shares of ownership of the family farm, instead of placing the farm in an estate to be sold as a unit. The family shares will be transferable, so that one of the heirs, wishing to convert his inheritance to some other form of property, may sell his share to a third party who may be entirely outside the family. But in this way the farm unit will remain intact.

Thus what starts off as essentially a "family-owned" farm may end up as a farm under group ownership, but still as a single unit and single operation, with single management for the entire unit. Increasingly, on units of this kind, management will be provided by a professional management group, standing between the individual owners and the operator of the farm. This is, of course, a kind of integration we have seen develop in recent years, although we haven't called it by that name.

Another way of meeting this problem is single operation of multiple tract ownership. The operator may be either a part owner or a complete tenant. In either event, he shares with others part of the traditional owner-manager-operator function. He surrenders certain freedoms and privileges in the process, but he gains greater rewards in return.

It is obvious from the above analysis that we will continue to develop a professional management group in agriculture. This won't necessarily be at the level of the general professional farm manager. The big growth will be in enterprise managers. After all, integration generally involves single enterprises, not whole farms.

Witness the managerial arrangements in contract broiler production, fruit and vegetable production under contract with canneries or freezing plants, and other specialized types of agricultural production where management can be easily separated as a package and assigned to someone other than the producer himself.

This may alter the traditional entrepreneurial, risk-taking function of the individual farmer. It may even move him in the direction of a quasi-riskless, semi-guaranteed wage earner. But this is not necessarily bad, per se. He may be, and frequently is, better off this way than he was before.

We often pride ourselves on being a nation of entrepreneurs. But we really aren't. We are no longer a nation of self-employed people. Of our total personal income payments in this country, more than two-thirds now come from salaries and wages. Less than one-sixth comes from rents, interest and royalties—payment for ownership of property.

Likewise, less than one-sixth arises from entrepreneurial income. In this are included farmers, small shop owners, self-employed artisans and the like. The percentage of our income from entrepreneurial sources is constantly decreasing. But this doesn't make us a poorer nation. We grow constantly wealthier, in the aggregate and on a per capita basis, as this shift progresses. Therefore, we should not automatically condemn as bad for agriculture a change which has really been beneficial to the rest of the economy.

3. The third social change accompanying vertical integration is that negotiated pricing will tend to displace the present competitive price-making structure.

This has already taken place in the case of fruits and vegetables grown under contract for specialized processing, broilers produced under contract, and some feeding contracts for large animals. We shall see the development of price bargaining agencies among producers, who will attempt to bargain growing terms and prices

before the crop is planted, the eggs put in the incubator or the livestock bred. Bargaining may center around rates of compensation to be paid producers for performing certain tasks in the production process, with selling price determination being left up to the skill of the integrator after the production process is completed.

In such a situation, price risk will be shifted completely from the grower. His interest will lie in his rate of compensation per unit of product or per hour, as is now the case with much of our broiler production. In that case, the producer has about the same kind of compensation motivation as does the worker in a Detroit automobile factory. His bargaining tactics may ultimately follow roughly the same pattern as his Detroit counterpart.

The real problem will be to compensate him adequately for his work and still maintain in him the incentive for efficiency and production which he had when he also carried his own entrepreneurial risk and had his own capital invested. This will not be easy.

4. The fourth social implication of integration is that distribution patterns will change markedly.

Under the kind of price bargaining outlined above, with real price-making shifted somewhere beyond the producer's gate and considerably concentrated as compared with present practice, existing marketing institutions will be under pressure. They will be bypassed by increasing quantities of the product as it flows from farm to consumer.

Local auction markets will be under pressure. Jobbers, wholesalers and even retailers may find it difficult to get enough volume to maintain themselves. After all, a completely integrated production and marketing process doesn't have a great deal of use for the conventional market place, jobber, wholesaler or in some cases, even retailer. Likewise, independent processors for many kinds of commodities may find themselves being bypassed. It may be that their chief hope for survival will be to become the integrator themselves. To the extent that this can be done, they will survive, but with a completely changed pattern of operations and functions.

A largely integrated industry will have other side-effects on distribution. For example, there really won't be much incentive for a large feed company to have a big advertising budget for poultry feeds if 85% of the poultry feed market is already under contract. The same may be said for a variety of other agricultural supplies. The total cost of assembling and the cost of distribution may be decreased for the agency or the company that does the integrating. Indeed, it is the prospect of this very decrease in cost that provides the main fuel behind the drive for integration.

POLITICAL IMPLICATIONS OF INTEGRATION: The political implications of vertical integration may be classed under five general headings.

1. Fewer farmers, and particularly fewer farmers in the entrepreneurial sense of the word, inevitably mean decreased political power for agriculture. Indeed, that trend has been apparent some in recent years, as farm politicians have faced increasing difficulty in holding the Farm Bloc together in Congress.

On the other hand, it should be pointed out that agri-business will continue to grow, and that some political support for farm oriented measures will always come from communities and businesses closely allied with agricultural production, processing and distribution. In balance, however, as commercial agriculture moves away from a "way of life" and becomes more business-like, and becomes more closely integrated

with processing and distribution functions, it is inevitable that the relative political power of agriculture will decline. Even so, farmers will continue to exert political influence out of proportion to their numerical strength.

2. Political leaders will resist vertical integration. In agriculture, in their oratory, in their congressional hearings and in their legislation. The philosophy of the small, owner-operated family farm is deeply ingrained in our sociological and political mores. The controversy over this issue is often more emotional than economic. Political pressure will continue to be on the side of maintaining small family farms, even though modern technology dictates strongly that family farms become larger.

There is no prospect that ambitious politicians in Congress will stop demagoging the emotionally explosive family farm issue, any time in the foreseeable future.

3. The third political implication of integration is that governmental aid will become available for producers to organize bargaining units to deal with processors on matters affecting price and production arrangements. In some states the agricultural extension service will likewise develop aids and guides for producers who want to form such bargaining units.

Sometimes processors and/or distributors who are the initiators of vertical integration will feel that such aid to producing groups constitutes an unwarranted interference with the price-making structure. However, the traditional price-making structure will already have been pretty well shackled by the very process of integration. Organization aid for producer-organized bargaining units will in effect develop countervailing economic power which will be able to match an already accomplished concentration of bargaining power.

The point here is that this whole process will tend to lead us still further away from the free market as a price-regulating mechanism.

4. The fourth political implication of integration is an increase in the amount of regulation over our entire marketing structure. Increased regulation will be distributed throughout the entire market structure. Some of it will be done by producer groups, some by processor and distributor groups and much of it by state and federal governments. The increased regulation will follow in the wake of integrated systems of production and marketing, further concentration of buying power among processors and distributors, and a trend toward larger and fewer producing units, especially in the case of specialty crops produced in restricted areas.

This growing maze of market regulation will move us further and further away from the traditional concept of the free competitive market. Indeed, much of the agricultural legislation of the last two or three decades has done just that, in that it has exempted certain producer groups and market practices from the provisions of the Sherman Anti-Trust Act.

The trend will be in the direction of administered prices, determined either through negotiation or by quasi-public regulatory bodies, rather than by direct competition in the market place.

Two types of market regulations which will be tried most frequently are (1) regulating the supply being produced for market, and (2) marketing agreements and orders. The first of these will be mainly an extension of federal rules and regulations, often associated with price support programs. They will involve marketing quotas, compulsory grading and inspection, quality control, uniform warehousing standards, regulations turning around government storage programs and ultimately market manipulation and arbitrary pricing associated with huge government storage programs.

Marketing agreements and orders are essentially a producer-initiated and producer-approved attempt to

promote orderly marketing. We now have market orders in 68 fluid milk markets in the U.S., and for some 35 specialty crops.

Efforts are currently afoot to extend the marketing order process to other commodities and on a broader geographic basis. Success of these efforts remains to be seen. However, as production of a commodity moves into fewer hands, and the commodity moves toward integration from producer through processor and distributor, increasing pressures will develop to extend the use of marketing orders.

When a particular commodity becomes part of a fully integrated system, intra-commodity market regulation is facilitated. This may take the form of producing to specification, producing to a predetermined schedule of deliveries and delivery to a predetermined processor. The price itself will in many cases have been negotiated before the production process begins. This will then become an almost completely regulated market, with rather complete control over both production and marketing. Governmental supervision of this kind of market arrangement is almost inevitable.

5. The fifth political implication of integration is that there will be growing governmental discrimination against the larger processors and marketing agencies who attempt to initiate integrated arrangements. This will place large commercial concerns at a competitive disadvantage vis-a-vis the smaller and medium sized concerns.

The larger concerns which attempt integration, especially under direct arrangements with producers, will face continuing harassing action from the Federal Trade Commission, the Department of Justice, and Congress itself. This is not new. It is an almost inherent characteristic of the body politic in this country that bigness and badness, or at least bigness and the suspicion of badness, are synonymous. This is a political burden which must be borne by big business.

This means that the really big concerns in food and fiber processing and distribution must attain efficiencies elsewhere to make up for any efficiencies that will be denied them in the process of vertical integration.

THESE CHANGES ARE NOT NECESSARILY BAD: Many agricultural and political leaders are frightened by the growing vertical integration in agriculture. They should not be any more wary of this change than of other economic and sociological changes occurring in modern society.

There is much good in integration. With proper direction, it will result in increased production and distribution efficiency, added control of quality, a more even flow of product seasonally and geographically, less risk of price in income variation to the producer, more rapid adaptation to scientific and technological innovations, and increased incomes to many producers who have become part of an integrated system.

These conditions are all desirable, from a broad economic point of view. The fact that an individual producer may surrender some of his managerial freedom and may transfer part of his risk-taking to someone else is really a very small price to pay for the advantages that flow out of an integrated system, if and when he becomes a full-fledged member of it.

It is clear from the preceding analysis that the forces of politics and the forces of economics are and will continue to be on opposite sides of the vertical integration question. In this engagement, politics will fight a delaying action. They will neither stop nor reverse the economic trend. They will only delay and confuse it. In the final analysis, the economic forces working in this process will be overwhelming.

Our problem, therefore, becomes one of intelligent analysis and direction of the future—not cowering fear of it.

Spray Program Reduces Grower's Celery Losses to Aster Yellows Virus to About 5%, Scientists Say

BERKELEY, CAL.—Aster yellows virus damage to celery in San Luis Obispo County, which once ran as high as 30%, has been reduced to about 5% through a chemical spray program, reported three University of California researchers. Celery growers in the Arroyo Grande Valley there annually produce about 1,200 acres or \$2.5 million worth of celery.

During 1951, 1952 and 1953 the spread of the aster yellows virus by the aster leafhopper became a serious economic threat to the celery industry in the valley, according to J. H. Freitag, professor of entomology, University of California; T. M. Aldrich, farm advisor, San Luis Obispo County, and R. M. Drake, deputy agricultural commissioner, San Luis Obispo County. Many individual growers lost 50% or more of their plantings.

Celery plants infected with the aster yellows virus are not marketable and are a total loss to the growers.

Infected plants are characteristically light green or yellow and show elongated, twisted and intertwined leaves. Diseased plants often are referred to as "Twisters."

The first symptom of the disease is a yellowing of the veins of the youngest leaves. Usually the yellowing is followed by an elongation and upright growth of the leaves. Diseased plants are often taller than adjacent healthy plants. As the disease progresses the plants become yellow and dwarfed. The petioles lose the upright position, become brittle and frequently crack. This often results in secondary disease organisms invading the plant and causing a heart rot. In some plants aster yellows virus causes a severe stunting of the leaves which results in an open flattened dwarfed plant.

Research at the university revealed that repeated field applications of DDT insecticide to the celery at regular intervals—sometimes as often as every 10 days and from 6-8 applications—generally obtained a good kill of leafhoppers in the fields but did not control the spread of the virus.

Aster yellows virus, besides causing a serious disease of celery, also infects many other vegetables, ornamental plants and weeds. The only groups of plants considered to be immune to infection are the cereals and grasses.

More than 20 different species of leafhoppers are capable of transmitting aster yellows virus but only one—the aster leafhopper—is important

in the spread of the disease in the Arroyo Grande Valley, according to the investigators at the university.

To determine the factors responsible for the high aster leafhopper populations in the valley, a study was made of the life history, habits, movements, host plants and favorite breeding areas of the leafhoppers. Periodical observations and collections were made by the scientists with an insect sweep net—in celery fields, on ditch banks, natural breeding areas and on cultivated crops—to learn where the leafhopper occurs, under what conditions it develops high populations and what is the main source of the leafhopper populations that move into the celery fields.

Creek bottom areas were found to be the most important habitat of the aster leafhopper. This insect thrives best on low, sparse, open vegetation in moist situations. However, high populations were also found on dense vegetation growing on stream margins. Large numbers of leafhoppers were regularly encountered on such plants as rabbitfoot grass, water parley, water cress, willow herb, common monkey-flower, speedwell and toad rush.

The aster leafhopper was also found in alfalfa fields, pastures, grain fields, home gardens, lawns and on ornamental flowers, the researchers pointed out. Leafhoppers from these habitats were usually considered to be of only minor importance in the spread of the aster yellows virus to celery. However, it was found that they were sometimes important locally when celery fields adjoined alfalfa fields or pastures.

Leafhoppers occurring on the range grasses and weeds during the spring, move—as the vegetation dries in April and May—into the creek bottom where they find a moist habitat suitable for the production of high populations. As the creek area gradually dries during May and June the leafhoppers move into the green celery fields. Because the creek vegetation dries only in certain areas and not in others there is a more or less irregular movement of the leafhopper from the creek into the celery fields over an extended period of time. This gradual influx would explain the failure of DDT to prevent spread of the virus.

The first infections of celery with aster yellows virus were usually noted in early June. Celery transplanted in early March and harvested in June escaped damage and showed only a trace of virus infection. In contrast, celery set out during April and May and harvested in July showed a definite increase in the percentage of plants infected. Severe damage was first noted in late June and became progressively more severe in July, August and September. Celery planted following the last week of July and harvested during the latter part of October, in November and December usually showed only a low percentage of infected plants.

The leafhopper populations in celery usually decreased during July and August. Because no reproduction of the aster leafhopper has been noted on celery, the spread of aster yellows virus appears to be entirely dependent on the insects that move into celery from other locations, the agriculturists explained.

The percentage of leafhoppers naturally infective with the aster yellows virus was determined by monthly collections in the natural breeding areas. Leafhoppers were collected and fed in groups of 10 on



HELICOPTERS apply DDT insecticides to favorable breeding sites of leafhoppers in creek bottoms in San Luis Obispo County. The practice has reduced losses to aster yellows virus in the area from 30% to 5%, scientists reported.

healthy test plants to determine the percentage actually carrying virus. Seasonal infectivity of the leafhoppers would indicate when and from what habitats the insects were potentially the most likely to spread the virus.

The percentage of aster leafhoppers found to be naturally infective varied with habitat, season and the predominant host plant in the area. Usually about 2% were naturally infective during April. As the season progressed, the percentage of infective

individuals increased to 12% in June, 22% in August and reached a peak of 36% in September of one year.

It is evident, concluded the testers, that the period of highest disease incidence in celery does not coincide with the presence of the highest number of leafhoppers in the celery fields. This is true because it takes 2-3 weeks for the disease symptoms to develop on the celery plants and also because the percentage of leafhoppers carrying virus increases as the season progresses.

New Fungicides Provide Good Control Of Rose Black Spot

WASHINGTON—Scientists have obtained nearly complete control of black spot, the nation's most destructive rose disease, by using two new fungicides, the U.S. Department of Agriculture has reported.

The fungicides—Phaltan (n-trichloro methylthiophthalimide) and Cyprex (n-dodecylguanidine acetate)—are organic chemical compounds. Applied to seriously infected foliage of rose plants, each fungicide was used as part of a combination spray in experiments conducted in 1957-58 at USDA's Agricultural Research Center, Beltsville, Md.

The combination spray included either of the miticides Aramite or Malathion, plus both of the insecticides DDT and lindane. These chemicals are commonly used in combination sprays and were found to have no effect on the action of the fungicide. Their insect-killing power is not reduced by presence of the fungicide.

Combining of different chemicals in one multi-purpose spray was developed through USDA research that began in 1950.

The work on roses is being carried on by Dr. John G. Palmer, Thomas J. Henneberry, and Robert V. Travis of USDA's Agricultural Research Service.

VOTERS REGISTER

SALEM, ORE.—Approximately 50% of the Highland bentgrass seed growers in Oregon had registered by April 17 to vote in the referendum on creation of a commission for this crop, reported Paul T. Rowell, agriculture chief. Deadline for growers to register was April 30.

Deep Placement Boosts Soybean Yields

EXPERIMENT, GA.—Soybean yields can be increased by deep placement of fertilizer.

A study showing that deep placement (12-inch level) of fertilizer increased yields of soybeans significantly over the normal placement was made over a three-year period by H. B. Harris, J. G. Futral, B. J. Johnson and H. M. Fullilove III at the Georgia Experiment Station here.

Yield response to 500 lb. of 4-12-12 fertilizer was evident at all placement levels, and the response appeared to be increased as the depth of placement was increased. The average yields for the three-year period were 14.9 bu. per acre for the 4-inch depth and 17.5 inch for the 12-inch depth of placement.

NAMED DIVISION MANAGER

NEW YORK—B. C. Drumm, sales manager of the multiwall bag department, Hudson Pulp & Paper Corp., announces the appointment of William F. Hazlewood as New York division manager. Mr. Hazlewood joined Hudson seven years ago as a gummed tape specialist in the industrial products department. Four years ago he was transferred to the multiwall department, where he has been serving as district manager in New York.

REMEMBER TO ORDER

CHASE BAGS

There's None Better!

FORMULATORS!

ESPESOL 5 now registered for labeling purposes
as a XYLENE-BASE solvent!

Eastern States Petroleum & Chemical Corporation

P. O. Box 5008

Houston 12, Texas

WA 3-1651



CELERY infected with aster yellows virus shows yellowing, twisting and intertwining of leaves.

USDA'S REPORT

(Continued from page 1)

containing N and P₂O₅ are reflected in the composition of 1958-59 supplies.

The report went on to a breakdown of the various materials as follows:

Nitrogen—The domestic nitrogen supply estimated for fertilizer purposes is 2,602,000 tons of N in 1958-59 (table 1). This is 6.7% more than in 1957-58.

Sizeable quantities of solid fertilizer-grade ammonium nitrate apparently are going into markets other than the fertilizer trade. Data contained in this report have been adjusted to include only ammonium nitrate for fertilizer purposes.

Liquid nitrogen supplies are expected to be even larger than in 1957-58 when they comprised over half the domestic supply of fertilizer nitrogen.

Anhydrous ammonia plants operated at about 82% of capacity in 1957. Estimated capacity Jan. 1, 1958, was 4,750,000 tons of NH₃, and about 175,000 tons came on stream during 1958. Plant expansions and new constructions are scheduled to bring in an additional 263,000 tons during 1959.

Urea capacity was 623,100 tons on Jan. 1, 1958, and may total 913,000 tons of urea with the completion of plants under construction.

TABLE 1. NITROGEN: Estimated Supply of Nitrogen for Fertilizer Purposes, 1957-58 and 1958-59, U.S. and Possessions

Item	1957-58 ¹	1958-59
Supply from domestic sources		
Solids:		
Ammonium nitrate	367	357
Ammonium sulfate	366	325
Urea	84	100
All other solids	205	223
Total solids	1,022	1,005
Liquids:		
Ammonia (incl. aqua)	739	780
All other	599	669
Total liquids	1,338	1,449
Total (solids and liquids)	2,360	2,454
Imports		
Ammonium nitrate	71	70
Ammonium sulfate	41	48
Urea	23	19
Ammonium nitrate-lime-stone mixtures	26	27
Sodium nitrate	78	80
All other	66	65
Total	305	309
Exports		
Ammonium nitrate	38	22
Ammonium sulfate	109	58
Urea	21	25
All other	59	56
Total	227	161
Net domestic supply	2,438	2,602

¹Revised.

Phosphate—The net domestic supply of phosphatic materials for fertilizer purposes in 1958-59 is expected to total 2,539,000 tons of P₂O₅ (table 2). This is 136,000 tons (5.7%) more than was available in 1957-58. Supplies of normal, enriched and concentrated superphosphates from domestic producers probably will be lower. Ammonium phosphate shipped as such by primary producers will remain near the level of last year. Captive use by producers for mixed fertilizer manufacture is expected to increase.

Technological progress has made possible the use of relatively pure phosphoric acid in the manufacture of liquid mixed fertilizers and high-analysis solid mixed fertilizers as well as for direct application. Wet-process phosphoric acid was utilized in the fertilizer industry until recently almost exclusively for the manufacture of concentrated superphosphate and ammonium phosphate—largely captive uses. Impurities in the acid made it difficult to use in other fertilizer production or to transport. Lately producers have been offering clarified wet-process acid which appears to be gaining some acceptance particularly by manufacturers of solid mixed fertilizers and for direct application. Because of this development, the 1958-59 supplies of phosphatic materials may deviate from estimates based on past trends more than anticipated.

Phosphoric acid (both furnace and clarified wet-process) for liquid fertilizer mixtures, high-analysis solid

mixed fertilizers, and direct application is believed to have supplied nearly 90,000 tons of P₂O₅ in 1957-58. The rate of production during the first half of 1958-59 indicates for the full year availability of over 200,000 tons which may be used for these purposes.

Two plants came on stream in 1958 primarily for production of ammonium phosphate but with built-in ability to make other carriers of P₂O₅ demanded by the industry. Another ammonium phosphate plant is expected on stream this spring.

It has been estimated that phosphoric acid (H₃PO₄) capacity will reach 2,100,000 tons of P₂O₅ during 1959. Production in 1957 was almost 80% of estimated capacity with about 60% being wet-process acid.

TABLE 2. PHOSPHATE: Estimated Supply of P₂O₅ for Fertilizer Purposes, 1957-58 and 1958-59, U.S. and Possessions

Item	1957-58 ¹	1958-59
Supply from domestic sources		
Normal and enriched superphosphates	1,327	1,270
Concentrated superphosphates	844	831
Ammonium phosphate ²	168	176
All other ³	251	443
Total	2,590	2,720
Imports		
Ammonium phosphate	45	30
All other	14	23
Total	59	53
Exports		
Normal superphosphate	49	39
Concentrated superphosphate	163	178
Ammonium phosphate	14	11
All other	20	6
Total	246	234
Net domestic supply	2,403	2,539

¹Revised.²Liquid and solid ammonium phosphate shipped as such by primary producers.³Includes ammonium phosphate produced in combination with potash salts to make mixed fertilizers; nitric phosphates; sodium phosphate; wet basic goods; calcium metaphosphate; natural organics; phosphate rock and colloidal phosphate; basic slag and estimates of wet and furnace phosphoric acid for liquid and solid mixed fertilizers and direct application.

Potash—The net domestic supply of K₂O for fertilizers during 1958-59 is estimated to be 2,159,000 tons, 13.3% over the previous year (table 3).

TABLE 3. POTASH: Estimated Supply of K₂O for Fertilizer Purposes, 1957-58 and 1958-59, U.S. and Possessions

Item	1957-58 ¹	1958-59
Supply from domestic sources		
Potassium chloride	1,808	2,076
Potassium sulfate ²	117	127
All other	20	20
Total	1,945	2,223
Imports		
Potassium chloride	169	173
Potassium sulfate	30	30
All other	14	21
Total	213	224
Exports		
Potassium chloride	222	267
Potassium sulfate	14	15
All other	16	6
Total	252	288
Net domestic supply	1,906	2,159

¹Revised.²Includes sulfate of potash-magnesia.

Estimates of European Corn Borer Damage to Corn Grown for Grain in 1958

—Story on Page 1—

State	Districts Included ¹	Total State Production	Value per Bushel	Estimated data	
				Number	1,000 Bu. \$1,000
Delaware	1	8,190	1.25	10,237	706
Illinois	9	579,738	1.04	602,928	13,163
Indiana	12	267,687	1.05	281,071	3,481
Iowa	12	645,830	.97	626,455	41,908
Kansas	4	66,528	.97	64,532	2,350
Maryland	1	24,552	1.24	30,444	1,001
Michigan	3	88,102	1.04	91,666	95
Minnesota	6	268,408	.89	236,883	1,190
Missouri	8	171,696	1.03	176,847	5,091
Nebraska	8	274,092	.91	249,424	23,102
New Jersey	1	7,684	1.25	9,605	459
New York	1	11,236	1.24	13,933	19
North Dakota	3	9,870	.82	8,093	516
Ohio	5	190,020	1.03	195,720	2,483
Pennsylvania	7	66,397	1.20	79,676	1,096
South Dakota	6	91,614	.90	82,480	2,682
Vermont	1	52	1.50	78	Trace
Virginia	2	35,298	1.27	44,828	696
West Virginia	1	7,150	1.33	9,509	54
Wisconsin	9	83,450	1.06	88,457	377

1/ Status of the European Corn Borer in 1958. Cooperative Economic Insect Report. Vol. 9, No. 5, pp. 53-62.

Both domestic deliveries and exports of potash during the first half of the year exceeded those of the same period in 1957-58. Several factors influenced the rate of movement. Seasonal price discounts made it difficult to judge to what extent the increased movement will continue during the remainder of the year. Graduated price discounts were in effect during the first six months, changing bimonthly for potassium chloride and quarterly for potassium sulfate.

The report then went on to say that the use of nitrogen had grown most rapidly. In 1949-50 plant nutrient consumption was 4,061,000 tons. Of this quantity, nitrogen amounted to only 1,005,000 tons, while P₂O₅ consumption was 1,951,000 tons and K₂O was 1,105,000 tons. By 1957-58, use of nitrogen had more than doubled to be almost equal to P₂O₅, an increase of 1,259,000 tons while P₂O₅ had increased only 329,000 tons (see figure 1). During the same period, consumption of K₂O had risen 816,000 tons to a total of 1,921,000 tons. The N:P₂O₅:K₂O ratio of 1.0:2.0:1 in 1949-50 had shifted to 2.0:2.0:1 in 1957-58.

In conclusion the report noted that mixed fertilizers contained 75% of the total plant nutrients purchased by U.S. farmers in 1946-47, the remainder being unmixed materials for direct application (figure 2). The proportion of straight materials has been rising markedly, reaching 32% by 1956-57, at the same time that total plant nutrient usage increased almost 3 million tons. In 1946-47 about 58.7%

of the plant nutrient content of materials for direct application was P₂O₅, whereas in 1956-57 P₂O₅ had fallen to 23.9 and N had risen to 63.5%.

Fersolin Corp. Plant Destroyed by Fire

SANTA CRUZ, CAL.—The brand new plant of the recently formed Fersolin Corp. was totally destroyed by fire last month just as production was beginning. The \$150,000 structure was swept to the ground by the fire which burst out without warning at night, from an unknown cause. The origin had nothing whatsoever to do with either the process circuit or the product, according to Robert Hind, vice president and general manager of Fersolin.

The plant facilities were just being installed, and production was just beginning at the time of the fire. Fersolin Corporation had been formed shortly before to produce loamite, made from derivatives of wood by-products, as a fertilizer. A broad advertising campaign had been prepared and was to have been launched in April. Since production has been completely interrupted, the campaign was withdrawn pending rebuilding, although plans regarding reconstruction have not yet been fully formed.

It will be at least the spring of 1960 before the product can now be brought out, according to Mr. Hind, who is also secretary of the parent firm, Pope and Talbot.

Former Chemical Company Official Dies at 90

BUFFALO, N.Y.—Shepard Kimberly, 90, a former officer of the American Agricultural Chemical Co., died April 1.

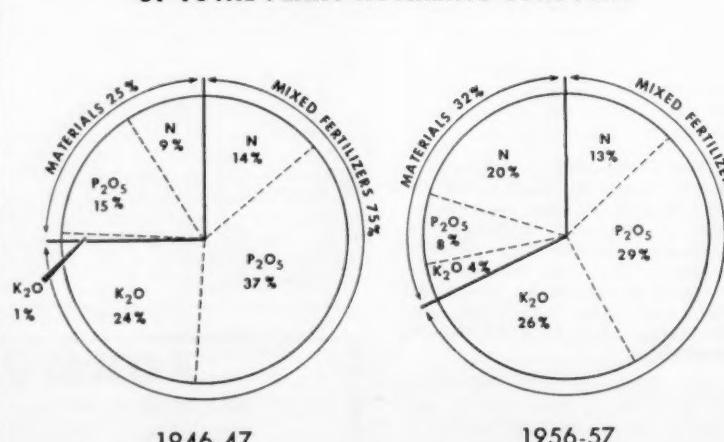
Mr. Kimberly had been president of the Cradle Beach Fresh Air Camp for Children, and a vestryman, warden and senior warden at Trinity Episcopal Church.

Massachusetts Firm Named Distributor

CEDAR RAPIDS, IOWA—Heil Equipment Co. of Boston, Brighton, Mass., is a new distributor for Highway Equipment Co., Cedar Rapids. The firm will sell and service lime spreaders, combination lime and fertilizer spreaders, widespread lime and fertilizer spreaders and mobile blenders made by the Cedar Rapids firm.

Heil will serve the states of Maine, New Hampshire, Rhode Island and eastern Massachusetts. Address of the new distributor is 164 Market St., Brighton, Mass.

MIXED FERTILIZERS CONTAIN A SMALLER PERCENTAGE OF TOTAL PLANT NUTRIENTS CONSUMED



Laboratory-Reared Boll Weevils Promise Better Methods to Control Cotton Insect

WASHINGTON — Laboratory-reared boll weevils are making possible year-round screening of new materials and methods that may ultimately provide better control of this cotton pest, the U.S. Department of Agriculture has reported.

Raising of enough weevils for laboratory testing was made possible by development of a synthetic diet that does not require aseptic techniques.

This diet was developed by Dr. Norman W. Earle and his co-workers of USDA's agricultural research service, at the Louisiana Agricultural Experiment Station, Baton Rouge. It has grown out of earlier pioneering research on insect diets with the pink bollworm and boll weevil conducted by Dr. Erma Vanderzant and her co-workers of the Texas Agricultural Experiment Station, College Station.

A special feature of the diet is the use of an acetone powder of squares or bolls as the protein source. Contamination by microbes is prevented by mold inhibitors.

Here are ways that a year-round supply of boll weevils may be used to advance the broad federal-state research effort against the pest, USDA says:

1. Testing insecticides. Laboratory-reared weevils are contributing to testing both conventional and systemic-type insecticides. Now scientists not only can produce weevils for year-round testing, but they can selectively control the test insects for uniformity in age, nutritional background, and insecticide resistance. They hope these research advantages will speed development of a systemic chemical that could be applied to cotton seed to protect the young growing plants from weevils for 10 weeks or longer.

Although resistance of boll weevils to chlorinated hydrocarbon insecticides has been demonstrated, scientists using the laboratory-reared weevils have discovered no build-up of resistance to organic phosphate insecticides in 16 generations of testing.

2. Basic studies. Investigation of the physiology, nutrition, and morphology of the boll weevil, which may reveal basic information leading to new approaches in weevil control, is being advanced by the availability of weevils for continual testing. These studies include research on reproduction, diapause, growth, hormones, and enzyme systems.

3. Breeding weevil-resistant cotton. Such research is now under way at the Arkansas Agricultural Experiment Station in cooperation with USDA, and at USDA's Cotton Insects Laboratory, Stoneville, Miss. Several leads have been discovered. Tolerance of plants to weevil damage, as well as adverse effects on the growth, survival, and the reproductive capacity of the pest, is also being studied, and may be aided by knowledge of the pest's nutritive requirements.

4. Boll weevil diseases. Work is now underway on evaluation of the effectiveness of insect pathogens in controlling weevils, especially during hibernation.

5. Radioactive control. Preliminary studies are now in progress to determine if boll weevils can be sterilized by gamma irradiation, without otherwise adversely affecting them. If such is the case, mass-liberations of sterile weevils might afford an effective control, as has been accomplished with the screwworm fly.

6. Mechanical control. Research is planned to determine if mechanical destruction of weevil-infested squares that fall to the ground will afford effective control.

7. Economic studies. Limited research is planned to obtain more information on the cost of boll weevil control, the benefits from various control practices, the best time to

start and stop insecticide application, and the value of applying insecticides at specific boll weevil infestation levels.

All of this research will be abetted by the use of laboratory-reared weevils. Before the advent of Dr. Vanderzant's pioneering work with insect diets, and Dr. Earle's later work, entomologists could rear boll weevils only when cotton plants or parts were available. Cotton was necessary both for nutrition and as a stimulus to egg-laying.

Fertilizer Company Head, 68, Dies in Florida

NARANJA, FLA. — George W. Moody, Jr., 68, president of the Florida East Coast Fertilizer Co., died here April 22.

Phosphoric acid increased 17%. Potash increased 20%.

Of all the areas of the world, Europe and North America produce and consume a huge percentage of total fertilizers. The figure is quoted as being between 80 and 90% of the total.

Manufacturing facilities in many parts of the world are increasing, but consumption is also maintaining its strength. Consumption of nitrogen is particularly strong, with phosphoric acid and potash showing signs of leveling off somewhat, according to the FAO report.

"Complex" fertilizers, those containing more than one main component are gaining in popularity throughout the world, the report indicates. Manufacturing facilities reflect this trend.

Another significant point made in

FAO

(Continued from page 1)

the FAO report is seen in its observation that the building of new fertilizer manufacturing facilities and the expansion of existing ones are going on in many parts of the world. This will result in greater self-sufficiency on the part of many nations to the extent that they will depend less upon imported products, and more on their own ability to produce.

New nitrogen plants are appearing, and older ones are being expanded in many places, particularly in Western Europe. Other countries in Central America, South America and Asia, have indicated their intentions to build or expand nitrogen plants.

Although mainland China was not included in the report on new and expanded nitrogen facilities, FAO notes that "very considerable" strides are being made in China for greater production of fertilizers.

You'll get a better understanding of the fertilizer market from this valuable new book



Crop-Use Patterns of Fertilizer in the United States by

J. R. ADAMS L. B. NELSON D. B. IBACH
U.S. DEPARTMENT OF AGRICULTURE

This significant report was compiled by the U.S. Department of Agriculture after thorough studies of fertilizer use in the United States. Crop-Use Patterns covers questions which, until now, have not been adequately answered. Crop-Use Patterns is based on information gathered from every fifth farm surveyed in the most recent U.S. Census . . . providing a broad base of national information.

Some of the questions answered are:

- what portions of croplands receive fertilizer
- how fertilizer is used among major crops
- how much acreage for each crop is fertilized

Specific fertilizer uses analyzed are:

Corn	Tobacco	Wheat
Oats	Cotton	Potatoes
All Crops and Cropland Pasture		
Hay and Cropland Pasture		

All graphically presented with 33 maps and numerous charts.

You'll want your own personal copy of Crop-Use Patterns. And you'll want to keep it handy where you can easily refer to its wealth of practical information about the use of fertilizer. To obtain your copy of Crop-Use Patterns, fill in and mail the coupon below . . . the supply is limited.

Only \$2.00
Order
Today

CropLife 2501 Wayzata Blvd. Minneapolis 40, Minn.
Please send copy(ies) of Crop-Use Patterns of
Fertilizer in the United States

\$2.00 per copy

Name
Address
City Zone
State

Croplife®

A WEEKLY NEWSPAPER FOR THE FARM CHEMICAL INDUSTRY

The regional circulation of this issue is concentrated in the Western states.

LEGISLATIVE STEP FORWARD . . .

Bill Introduced to Include Nematocides, Desiccants, Defoliants in Pesticide Law

THE BILL introduced in the House of Representatives by Harold D. Cooley (D., N.C.) to bring nematocides, defoliants, desiccants and plant regulators under the provisions of the Federal Act, is welcomed by the pesticide industry as a whole. The amendment would remove these products from inclusion under the food additives law, thus enabling them to come under the same labeling, registration and regulatory controls as now applied to other agricultural pest control products under the Federal Insecticide, Fungicide, and Rodenticide Act.

The present Federal Act, enacted in 1947, was conceived long before these products entered the market, or even existed. While these products now come under some state laws which are similar to the provisions of the Federal Act, the materials are not regulated under the latter statute.

These products have become too important and too widely used not to be under regulation at the Federal level. Various organizations and groups have expressed the opinion that there should be an amendment to the Federal Act by which these materials would be included. Experience has proved that farmers and growers throughout the country have been benefited by such an arrangement in the case of other pesticides.

This is particularly true in view of the double roles carried by some materials. A certain chemical may be used as a pesticide and also as a defoliant, desiccant and perhaps plant regulator. An example is 2,4-D which, at one concentration is used as a herbicide to kill certain plants and at a diluted concentration may be employed as a plant regulator to lessen premature fruit drop. Its use as a herbicide is already subject to provisions of the

Federal Act, but this jurisdiction does not cover the chemical's use as a plant regulator.

Somewhat the same condition exists in the cases of other materials. Much confusion will be eliminated when all of these chemical products used in agriculture are regulated uniformly at the Federal level.

Some persons may wonder how far reaching is the need for inclusion of these new products under Federal law. Approximately 4,000 different nematocides, defoliant, desiccant and plant regulator products are presently on the market, and their numbers are likely to expand in the years ahead. The trend toward increased use of such chemicals in agriculture is so pronounced that expansion in both the numbers of products and their volume seems inevitable.

The bill would become effective upon enactment, thus permitting the U.S. Department of Agriculture to begin registration of newly-regulated products. Tolerances on the new products would also have to be set by the Department of Health, Education and Welfare, under the Federal Food, Drug, and Cosmetic Act.

Certain sections of this Act, as well as the Federal Insecticide Act, would not become effective immediately, however. Provision is made whereby these sections would not become applicable until March 5, 1960, nor later than the same date in 1961. This provision is made to avoid hardships on the part of makers who must collect additional data or make labeling changes required by the legislation.

So a giant step has been taken. Industry people are hoping for enactment of this bill during the current session of Congress.

NAC Offers Pictures, Commentary to Improve Public Attitude on Pesticides

CRYING NEED for better understanding on the part of the public of the beneficial role played by pesticides in providing better foods and health is met to a substantial degree in a new picture slide-commentary program being issued by the National Agricultural Chemicals Assn. under the title, "Pesticides—Boon to Mankind." The program, running about 30 minutes, depending upon the pace of the narrator, will give many a private citizen an entirely new appreciation for pesticides.

The program rolls up its sleeves and dives immediately into the area of food . . . where many pesticide foes feel most strongly about pesticide "poisons." Pictures show a housewife in a supermarket . . . her family at dinner . . . and commentary stating that "pesticides are the chemicals which assure us that our foods will be free from pest damage and contamination."

Pictures of grasshopper plagues . . . of diseased sweet potatoes . . . of weeds choking out useful plants . . . of rodents in grain bins . . . and of the health hazard of mosquitoes give the viewer a new conception of what is meant by "expensive" pests.

A tactful reminder is given that the "balance of nature" is not the answer to agricultural pest control and man is able to survive in this competitive world only because of his superior intelligence. "The era of plenty in which we live today is the direct result of our ability to understand and control nature," the script points out.

Charts showing how food prices would rise if

there were inadequate control of pests; the role of science in studying pest control; the steps involved in testing and developing new pesticides; and a reminder of the Federal and State laws protecting the public all add to the impact.

The program declares that like autos and electricity, pesticidal chemicals are becoming standard and useful tools of civilization. "They are products of man's intelligence. They bring amazing and wonderful benefits when they are properly used," the script says.

A final entreaty urges the listener to **READ THE LABEL.** "More than \$1 million in research is boiled down into simple directions and precautions on the label," the commentary states. "Labels give contents of the container, what the pesticide will control, how to use it and what to avoid for your own and others safety," it continues.

The program ends with a picture of the same family back at dinner, with the final commentary that we can "look forward with confidence to seeing scenes like this one not only throughout the U.S., but all over the world—thanks to the increased productivity and improved quality of crops made possible by the proper use of pesticides."

The NAC Assn., 1145 19th St., N.W., Washington 6, D.C., has all the necessary information about use of the slide program. The total effect is highly favorable. It should be shown in hundreds of communities to offset much of the hostility now felt towards pesticides by misled citizens.



Croplife's Home Office

Croplife



Member of Business
Publications Audit

Member of National
Business Publications

CROPLIFE is a controlled circulation journal published weekly. Weekly distribution of each issue is made to the fertilizer manufacturers, pesticide formulators and basic chemical manufacturers. In addition, the dealer-distributor-farm adviser segment of the agricultural chemical industry is covered on a regional (crop-area) basis with a mailing schedule which covers consecutively, one each week, four geographic regions (Northeast, South, Midwest, and West) of the U.S. with one of four regional dealer issues. To those not eligible for this controlled distribution Croplife subscription rate is \$5 for one year (\$8 a year outside the U.S.). Single copy price, 25¢.

LAWRENCE A. LONG

Editor

DONALD NETH

Managing Editor

EDITORIAL STAFF — John Cipperly, Washington Correspondent; George E. Swarbrick, Canadian and Overseas Editor; Emmet J. Hoffman, Marketing Editor; James L. Engfer, Editorial Assistant.

ADVERTISING STAFF — Wilfred E. Lingren, Advertising Director; Carl R. Vetter, Advertising Department Manager; Bruce A. Kirkpatrick, Advertising Production Manager; R. Dale Swenson, Promotion Manager.

BUSINESS STAFF — Martin E. Newell, Chairman of the Board of Directors; Milton B. Kihlstrom, President and Treasurer; Wilfred E. Lingren, Executive Vice President; Don E. Rogers, Vice President; Paul L. Dittemore, Vice President; Donald Neth, Secretary; T. A. Gaden, Circulation Manager; James G. Patridge, Assistant Treasurer; Richard Ostlund, Office Manager; Walter O. Buchkosky, Production Superintendent.

BRANCH OFFICES

EASTERN STATES — Paul L. Dittemore, Manager; James W. Miller and George W. Potts, Advertising Sales Representatives; Suite 3214, 551 Fifth Ave., New York 17, N.Y. (Tel. Murray Hill 2-2185).

CENTRAL STATES — Don E. Rogers, Manager; Henry S. French, Assistant Manager; Amos W. Standish, Advertising Sales Representative; 2832 Board of Trade Bldg., 141 W. Jackson Blvd., Chicago 4, Ill. (Tel. Harrison 7-0575).

SOUTHWEST — Martin E. Newell, Manager; Thomas E. Letch, Assistant Manager; 612 Board of Trade Bldg., Kansas City 5, Mo. (Tel. Victor 2-1350).

NORTHWEST — Paul A. Anderson, Advertising Sales Representative, P.O. Box 67, Minneapolis 40, Minn. (Tel. Franklin 4-5200).

WASHINGTON CORRESPONDENT — John Cipperly, 604 Hibbs Bldg., Washington, D. C. (Tel. Republic 7-8534).

EXECUTIVE AND EDITORIAL OFFICES — 2501 Wayzata Blvd., Minneapolis, Minn. Tel. Franklin 4-5200. Bell System Teletype Service at Minneapolis (MP 179), Kansas City (KC 295), Chicago (CG 340), New York (NY 1-2452), Washington, D.C. (WA 82).

Published by

THE MILLER PUBLISHING CO.
2501 Wayzata Blvd., Minneapolis, Minn.
(Address Mail to P. O. Box 67, Minneapolis 40, Minn.)



Associated Publications — The Northwestern Miller, The American Baker, Farm Store Merchandising, Feedstuffs, Milling Production.

MEETING MEMOS

May 18-20—45th midyear meeting, Chemical Specialties Manufacturers Assn., Drake Hotel, Chicago.

May 20-21—Annual "Pest-O-Rama," in Miami, Fla., sponsored by the Dade County Agricultural Agent, Dade County, Fla.

June 17-19—Northeast Branch American Society of Agronomy, University of Delaware, Newark, Del.

July 15-17—Southwestern Fertilizer & Grade Meeting, Galvez Hotel, Galveston, Texas.

Aug. 30-Sept. 3—American Institute of Biological Sciences annual meeting, Pennsylvania State University, University Park, Pa.

Meeting Memos listed above are being listed in this department this week for the first time.

May 21—Chemical safety workshop sponsored by the Manufacturing Chemists' Assn., Palmer House, Chicago.

June 4—Executive committee meeting, fertilizer section, National Safety Council, Hotel Roanoke, Roanoke, Va.

June 9-10—Seventeenth Annual Convention of the Association of Southern Feed and Fertilizer Control Officials, Velda Rose Motel, Hot Springs, Ark.; Maurice Rowe, Virginia Department of Agriculture, 1122 State Office Bldg., Richmond 19, Va.

June 9-11—Pilot plant demonstration on recent developments in fertilizer production technology, Muscle Shoals laboratories, Sheffield, Ala.

June 11-13—87th annual meeting, Manufacturing Chemists' Assn., The Greenbrier, White Sulphur Springs, W.Va., John L. Gillis, vice president of Monsanto Chemical Co., program chairman.

June 14-17—National Plant Food Institute, Annual Convention, the Greenbrier, White Sulphur Springs, W. Va.

June 15-18—Western Society of Soil Science, University of California, Davis, Cal.

June 23-25—Pacific Branch, Entomological Society of America, 43rd annual meeting, El Dorado Hotel, Sacramento, Cal. Dr. Leslie M. Smith, University of California, Davis, branch chairman.

June 27—Del-Mar-Va Peninsula Fertilizer Assn., Ocean City, Md.

June 29-30 Fertilizer Industry Conference, University of Illinois, Urbana, Ill.

June 29-30—Seventh Annual California Fertilizer Conference, University

of California campus, Davis, Cal. J. H. Nelson and Earl R. Mog, co-chairmen.

July 7-9—Regional Fertilizer Conference, co-sponsored by the Pacific Northwest Plant Food Assn. and state colleges and universities in the area, Winthrop Hotel, Tacoma, Wash.

July 29—Annual Kentucky Fertilizer Conference, Guignol Theater, University of Kentucky campus, Lexington, Ky.

July 31—Agronomy Field Day, University of California, Davis, Cal.

Aug. 3-7—Gordon Research Conference on biochemistry in agriculture, Kimball Union Academy, Meriden, N.H.

Aug. 18-22—Annual Convention of the Canadian Fertilizer Assn., Bigwin Inn, Lake of Bays, Ontario.

Aug. 26-28—Soil Conservation Society of America, 14th Annual Meeting, Rapid City, S.D.

Oct. 13-14—Western Agricultural Chemicals Assn., fall meeting, Villa Motel, San Mateo, Cal. C. O. Barnard, executive secretary.

Oct. 14-16—Pacific Northwest Plant Food Assn. Annual Convention, Chinook Hotel, Yakima, Wash.

Oct. 21-23—National Agricultural Chemicals Assn., 26th annual meeting, French Lick-Sheraton Hotel, French Lick, Ind., Lea S. Hitchner, executive secretary.

Nov. 4-6—Fertilizer Industry Round Table, Mayflower Hotel, Washington, D.C. Dr. Vincent Sauchelli, National Plant Food Institute, chairman.

Nov. 9-11—California Fertilizer Assn., 36th annual convention, Fairmont Hotel, San Francisco.

Nov. 16-20—National Aviation Trades Assn., 20th annual convention, New Orleans, La.

Dec. 9-11—International Crop Protection and Pest Control Exhibition, Seymour Hall, St. Marylebone, London, England.

Chemical Workers Agree On New Contract in Nevada

HENDERSON, NEV.—A plant spokesman has announced the American Potash and Chemical Corp. and the International Chemical Workers Union have reached agreement on a new work contract.

The amount of wage increases granted the chemical union workers will not be announced until the membership has an opportunity to ratify the new pact.

An identical wage boost was offered machinists, pipefitters, electricians and operating engineers but was rejected by all four unions, the spokesman said.

Hooker Directors, Officers Named at Annual Meetings

NIAGARA FALLS, N.Y.—Stockholders of Hooker Chemicals Ltd., North Vancouver, B.C., recently elected new directors at the annual stockholders meeting held in Vancouver. Subsequently, the directors elected new officers for the year at Niagara Falls. Hooker Chemicals Ltd. is a subsidiary of Hooker Chemical Corp. with headquarters here.

Elected directors and officers were Thomas E. Moffitt, president; Horace W. Hooper and George E. Gentes, vice presidents; Ansley Wilcox, II, secretary; Edward W. Mathias, treasurer, and George C. Richards, assistant treasurer. Additional directors elected by stockholders were R. Wollcott Hooker, Robert E. Wilkin, Frank W. Dennis and Robert A. C. Douglas. All are Hooker executives except Mr. Douglas, a Vancouver attorney.

Mr. Gentes, recently named production manager, western chemical division of Hooker Chemical Corp., replaces as a vice president and director F. Leonard Bryant, recently appointed general manager of Hooker's phosphorus division. Mr. Mathias, recently elected treasurer of Hooker Chemical Corp., replaces as treasurer and director Thomas F. Willers, now general manager of the eastern chemical division. Mr. Dennis as a director takes the place of R. Lindley Murray, board chairman of the parent company. The other directors and officers were reelected.

AQUATIC WEED PRODUCT

MIDLAND, MICH.—A new aquatic weed control chemical product, "Kuron," made by the Dow Chemical Co. has been cleared by federal regulations for use in lakes, the company has announced. The product is designed to control a number of varieties such as water milfoil, fanwort, bladderwort and waterweed, a company spokesman said.

Classified Ads

Classified advertisements accepted until Tuesday each week for the issue of the following Monday.

Rates: 15¢ per word; minimum charge \$2.25. Situations wanted, 10¢ a word; \$1.50 minimum. Count six words of signature, whether for direct reply or keyed care of this office. If advertisement is keyed, care of this office, 20¢ per insertion additional charged for forwarding replies. Commercial advertising not accepted in classified advertising department. Display advertising accepted for insertion at minimum rate of \$11 per column inch.

All Want Ads cash with order.

BUSINESS OPPORTUNITIES

FOR SALE—FERTILIZER PLANT GOOD Iowa location. Granulation equipment. Sell on contract. Write P.O. Box 662, Sioux City, Iowa.

MISCELLANEOUS

BRUSH AND WEED KILLER KILL SUBMERSED water weeds which foul up motor propellers, tangle fishing gear and choke irrigation ditches with R-H Granular Weed Rhp. Inexpensive, easy to use, sure results. For details write Reason-Hill Corporation, Box 36CL, Jacksonville, Ark.

KILL BRUSH at low cost with amazing R-H Brush Rhp. Will not injure grasses, grains, cattle, or other animals. See your dealer, or write Reason-Hill Corporation, Box 36CL, Jacksonville, Ark.

Moves Sales Office

CHAMBLEE, GA.—American Cyanamid Co. has announced transfer of its Atlanta sales office and warehouse operations to its new building at 5180 Peachtree Industrial Blvd., in Chamblee, Ga. The new building contains 12,300 square feet of office space and 30,000 square feet in the warehouse. H. C. Hughes, local branch office manager, said the transfer includes Lederle Laboratories, agricultural, industrial chemicals, organic chemicals, pigments and surgical products divisions, and the Formica Corp. subsidiary.

INDEX OF ADVERTISERS

The index of advertisers is provided as a service to readers and advertisers. The publisher does not assume any liability for errors or omissions.

Abrasion & Corrosion Eng.	.....	Kraft Bag Corp.	.....
Allied Chemical Corp., Nitrogen Div.	.....	.....	.....
Amchem Products, Inc.	.....	.....	.....
American Potash & Chemical Corp.	.....	.....	.....
American Potash Institute	.....	.....	.....
Arcadia Pump Mfg. Co.	.....	.....	.....
Armour Fertilizer Works	.....	.....	.....
Ashcraft-Wilkinson Co.	.....	.....	.....
Baker, H. J., & Bro.	.....	.....	.....
Baughman Manufacturing Co., Inc.	.....	.....	.....
Bemis Bag Co.	.....	.....	.....
Blue, John, Co.	.....	.....	.....
Bradley & Baker	.....	.....	.....
Broyhill Company, The	.....	.....	.....
Burgess Publishing Co.	.....	.....	.....
Chantland Mfg. Co.	.....	.....	.....
Chase Bag Co.	.....	.....	.....
Chemagro Corp.	.....	.....	.....
Chemical Eng. Serv. Div. of	.....	.....	.....
Manitowoc Shipbuilding, Inc.	.....	.....	.....
Chemical Insecticide Corp.	.....	.....	.....
Clover Chemical Co.	.....	.....	.....
College Science Publishers	.....	.....	.....
Collier Carbon & Chemical Corp.	.....	.....	.....
Commercial Solvents Corp.	.....	.....	.....
Consolidated Mining & Smelting Co.	.....	.....	.....
Crown Zellerbach Corp.	.....	.....	.....
Davison Chemical Co.	.....	.....	.....
Deere, John & Co.	.....	.....	.....
Dampster Mill & Mfg. Co.	.....	.....	.....
Diamond Alkali Co.	.....	.....	.....
Dow Chemical Co.	.....	.....	.....
E. I. du Pont de Nemours & Co., Inc.	.....	.....	.....
Duval Sulphur & Potash Co.	.....	.....	19
Eastern States Petroleum & Chem. Corp.	.....	.....	.....
Emulsion Chemical Corp.	.....	.....	.....
Escambia Chemical Corporation	.....	.....	19
Fairfax Biological Laboratory	.....	.....	.....
Flexo Products, Inc.	.....	.....	.....
Food Machinery & Chemical Corp.	.....	.....	.....
Frontier Chemical Co.	.....	.....	.....
Gates Rubber Co.	.....	.....	.....
Geigy Agric. Chemicals	.....	.....	.....
Grace Chemical Co.	.....	.....	.....
Grand River Chemical Div. of Deere & Co.	.....	.....	.....
Hahn, Inc.	.....	.....	.....
Hanson Equipment Co.	.....	.....	.....
Harshaw Chemical Co.	.....	.....	.....
Henderson Mfg. Co.	.....	.....	.....
Hercules Powder Co.	.....	.....	.....
Highway Equipment Co.	.....	.....	.....
Hough, Frank G., Co.	.....	.....	.....
Inland Chemical Corp.	.....	.....	.....
International Minerals & Chemical Corp.	.....	.....	.....
Johns-Manville Corp.	.....	.....	.....
Jones, Robin, Phosphate Co.	.....	.....	.....
Kalo Inoculant Co.	.....	.....	.....
Lever Brothers Co.	.....	.....	17
Tennessee Corp.	.....	.....	.....
Texas Gulf Sulphur Co.	.....	.....	.....
Union Bag-Camp Paper Corp.	.....	.....	.....
U. S. Borax & Chem. Corp.	.....	.....	.....
U. S. Phosphoric Products Division	.....	.....	.....
U. S. Industrial Chemicals Co.	.....	.....	.....
U. S. Potash Co.	.....	.....	.....
U. S. Rubber Co., Naugatuck Cham. Div.	.....	.....	.....
U. S. Steel Corp.	.....	.....	.....
Velsicol Chemical Corp.	.....	.....	.....
Wisconsin Exptl. & Distr. Co.	.....	.....	.....
Wilco Chemical Co.	.....	.....	.....



What readers say about Croplife

CHARLES L. HOVEY

Head of Agricultural Chemicals
Research
Eastern States Farmers' Exchange
West Springfield, Mass.
A Farmers' Cooperative Purchasing
Association

"Croplife is regularly read by certain members of our staff. Because Croplife is a controlled circulation newspaper published weekly, it brings to us pertinent and timely information of a specialized nature. We have found no other publication which has so successfully accomplished this task."



Croplife

2501 Wayzata Blvd.
Minneapolis, Minn.

EASTERN STATES OFFICE
551 Fifth Ave.
New York 17, N.Y.
MURRAY HILL 2-2185

CENTRAL STATES OFFICE
141 West Jackson
Chicago 4, Ill.
HARRISON 7-0515

SOUTHWESTERN STATES OFFICE
Board of Trade Bldg.
Kansas City 5, Mo.
VICTOR 2-1350

NORTHWESTERN STATES OFFICE
P. O. Box 67
Minneapolis 40, Minn.
FRANKLIN 4-5200

